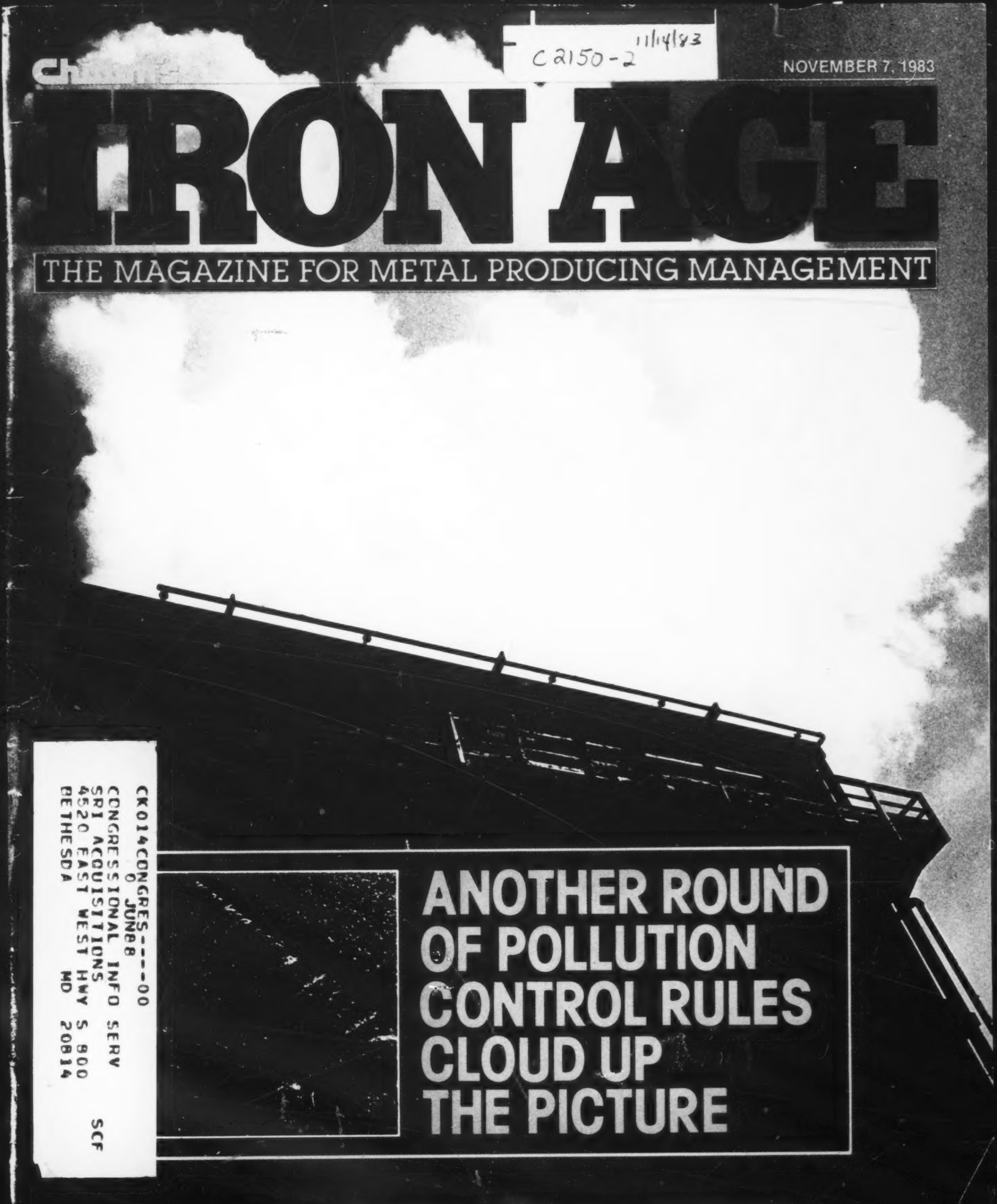
C2150-2 11/14/83

Chilton's

NOVEMBER 7, 1983

IRON AGE

THE MAGAZINE FOR METAL PRODUCING MANAGEMENT



CK014CONGRES---00
0 JUN88
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS
4520 EAST WEST HWY S 800 SCF
BETHESDA MD 20814

ANOTHER ROUND OF POLLUTION CONTROL RULES CLOUD UP THE PICTURE

U.S. STEEL'S GARY WORKS SCORES BIG IN PRODUCTIVITY

WEIRTON BEGINS TO PICK ITSELF UP

STEEL SHAKES THE MONEY TREE FOR STEEL EQUIPMENT

VOL. 226, NO. 27

IRON AGE

NOVEMBER 7, 1983

COVER STORY

MP-3 **MORE POLLUTION CONTROL RULES CLOUD PICTURE**
Just when steel producers begin to see the light, another round of regulations appears on the horizon.

FEATURES

33 **WEST COAST SHIPBUILDERS ARE BITTER**
The Navy is allocating more work to other shipyards.

43 **COMPANIES WRITE NEW RX'S FOR HIGH MEDICAL COSTS**
They're raising deductibles and focusing on 'wellness' plans.

53 **TECHNOLOGY TRANSFER: THAT'S WHAT IT'S ALL ABOUT**
Little technology is moving into the production lines. Why?

66 **METALCLEANING CAN BE HAZARDOUS TO YOUR HEALTH**
Knowing which substance to use and how to use it is vital.

MP-7 **STEEL READY TO LOOSEN MONEY FOR MILL EQUIPMENT**
It won't take much to put modernization projects in motion.

MP-12 **WEIRTON STEEL BEGINS TO PICK ITSELF UP**
It has become the largest employee-owned company.

MP-16 **U. S. STEEL'S GARY WORKS SCORES IN PRODUCTIVITY**
Renovating means a 1.6-million-ton-slab capacity per year.

NEWSFRONTS

7 **EDITORIAL**
For me, Topic 'A' was easy.

13 **METALWORKING NEWSFRONT**
Machine tool industry may be on the road to recovery.

28 **BUSINESS FINANCEFRONT**
Deregulation of interest rates hasn't sent them sky-high.

36 **METALWORKING PRICE TRENDS**
Producer prices posted a modest 2 pct rise in September.

37 **YOU AND YOUR JOB**
Does perfectionism really hinder your bid for success?

51 **TECHFRONT**
New chrome-moly steel heads for refinery pressure vessels.

76 **PRODUCTS NEWSFRONT**
A side-loader and stacker crane solve an inventory problem.

85 **MATERIALS NEWSFRONT**
The domestic steel recovery continues at a steady pace.

100 **BUSINESS FORECAST**
U.S. factories are nearing an 80 pct operating rate.

MP-1 **METALPRODUCING NEWSFRONT**
U.S. and foreign steel mill equipment builders join forces.

DEPARTMENTS

8 EDITORIAL STAFF
11 LETTERS
24 PEOPLE ON THE MOVE
27 INDUSTRIAL BRIEFS
87 P&P DATA 10/24
89 FERROUS SCRAP 10/24
90 BUSINESS STAFF
90 AD INDEX
91 MANAGEMENT SERVICE CARD
93 STEEL PRICES
97 STEEL PRICES
98 CLEARING HOUSE

NEXT ISSUE

Automating the machine tool selection process.

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089, appearing on the first Monday and third Friday each month. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

METALWORKING PRICE TRENDS

Prices' modest rise shows the economy turning up gradually

Producer prices continue to edge upward.

Prices overall advanced 0.2 pct in September, midway between August's 0.4 pct rise and July's 0.1 pct increase.

Declining costs for new cars and gasoline cancelled out most of the sharp increases in food prices, the Bureau of Labor Statistics said.

This does not necessarily mean that auto prices dropped during the month. Instead, consumers reportedly are unable to obtain bigger cars, which are selling well, and are opting for smaller, low-priced vehicles.

The finished goods price index for September was 285.1, equivalent to a cost of $2,851 for goods that cost business $1,000 in 1967. This was a 0.4 pct decline before seasonal adjustment. From September 1982 to last September, the finished goods price index has moved up 1.4 pct.

The index for factory, construction and other capital equipment dropped 0.3 pct in price after rising 0.7 pct in August. Accounting for 22.5 pct of the producer price index, capital equipment prices are a primary influence on the cost of doing business in the long run and a decline is good news for companies trying to expand to keep pace with economic recovery.

Sharp declines were registered for passenger cars and light motor trucks, mostly the result of end-of-model-year allowances and other incentives to help dealers liquidate inventories. This is considered an unusual event compared with normal conditions.

The index for capital equipment moved down 0.3 pct after increasing 0.7 pct in August. The downturn was predominantly the result of sharp declines in the prices for heavy trucks and other motor vehicles. Prices for machine tools, oil field and gas field machinery and mining machinery were slightly lower.

A look at the figures shows that in September, compared with the previous month, 12 price categories went up, eight went down and two showed no change. But if the aberrative behavior of the motor vehicle segment of the economy is removed, the other 19 listed metalworking product lines showed little or no change in prices compared with the previous month.

Also, for 21 product lines shown—excepting valves and fittings, for which no figures are available—the average increase was only 2 pct.

Latest Month Covered: September, 1983

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	377.5	+ 0.1	+ 1.7
Metal Forming Machine Tools	415.5	− 0.2	+ 1.3
Agricultural Machinery & Equip.	328.0	+ 0.3	+ 4.2
Construction Machinery & Equip.	353.4	+ 0.2	+ 1.7
Industrial Process Furnace & Ovens	362.7	+ 0.1	+ 2.1
Industrial Material Handling Equip.	285.3	+ 0.1	− 0.1
Pumps, Compressors & Allied Equip.	345.8	+ 0.1	− 0.7
Fluid Power Equip. (Dec. 1970 = 100)	253.8	+ 0.1	+ 2.9
Mechanical Power Transmission Equip.	315.6	+ 0.2	+ 0.1
Automobiles	208.0	− 4.8	+ 4.1
Motor Trucks—Light	255.2	− 5.6	− 0.6
Motor Trucks—Heavy	301.2	− 4.8	+ 4.1
Railroad Equipment	357.5	− 0.1	+ 2.1
Fabricated Metal Structural Products	303.8	+ 0.3	− 0.8
Electric Motors	334.0	+ 0.1	+ 7.3
Valves (Metal, Ex-Fluid Power—Dec. 1982=100)	99.5	− 0.3	NA
Ball & Roller Bearings	332.2	+ 0.4	− 0.9
Cutting Tools & Accessories	275.3	+ 0.6	+ 1.3
Heating Equipment	244.7	0	+ 2.3
Plumbing Fixtures & Brass Fittings	291.5	− 0.1	+ 5.2
Metal Containers	338.3	+ 0.1	+ 2.9
Miscellaneous Metal Products	287.7	0	+ 1.4

Data based on U.S. Labor Dept.'s Producer Price Index

STEEL READY TO SHAKE LOOSE MONEY FOR MILL EQUIPMENT

Although modernization is on hold, it won't take much to put plans in motion.

BY GEORGE J. MCMANUS

"The pipeline is full," says Charles E. Half, manager of metals sales for Scientific Systems Services, Inc. "All it needs is a little lubricating."

Mr. Half says the steel industry has lined up a lot of modernization projects. Most of these are on hold, he indicates, but it wouldn't take much to shake them loose.

Not everyone would agree with this assessment. There was considerable gloom at the recent convention and exposition of the Association of Iron and Steel Engineers (AISE). The attendance of nearly 17,500 was remarkable for the times, but headlines about more steel cutbacks did nothing to cheer visitors.

It's certainly true, however, that the steel pipeline is filled with new technology. At the AISE show, it was the quality as well as the quantity of innovation that struck people. Coming through the pipeline are such radical departures as continuous steelmaking, horizontal casting, thin slab casting, direct rolling, direct current steelmaking, and plasma refining.

In more conventional areas, big advances are being made in coating processes, measuring devices and control systems. At every step in steel manufacture, there seems to be better ways of doing things.

"The equipment pays for itself in a week," says Mike Brown, vice president and general manager, Land Instruments, Inc. Mr. Brown was talking about Land's new infrared portable thermometer. Capable of accurate readings up to 5,500°F, he said, the unit has given fuel savings of 17 pct or $400,000 a month in one application.

Krupp and ASEA report big savings from their joint development of a direct current, single electrode arc furnace. "The payoff is very short," says Karl Kullenberg, general manager of sales for Krupp's metallurgical plant division.

A 50-ton direct current furnace has been installed at Avesta Jarnverk AB in Sweden. Electrode consumption has been reduced from 10 lbs per metric ton to 4.5 lbs with the direct current design.

Continuous casting is shooting off in a number of new directions. First, there is work on a process that would cast thin slabs. Mannesmann Demag Corp. is working on casting slabs between 1½ to 2 in. thick. With this size, it would be possible to skip part of the strip mill operation.

"As soon as this is developed, I am sure the mini-mills will go into sheet," says Hans Klingelhoefer, executive vice president of Mannesmann Demag Wean.

In a really exotic area, a number of companies are trying to cast sheet thin enough to bypass the strip mill altogether. Mannesmann Demag is shooting for a sheet ¼ to ½ in. thick United States Steel Corp. and National Intergroup, Inc. (formerly National Steel Corp.), are among the others working on the casting of this sheet.

Apart from its effect on processing, the thin steel program could open the door for a complete new field of metallurgy. Rapid solidification of thin material has already produced exceptional properties in electrical steels. Metallurgists look for fast cooling to improve the structures of all grades.

Very much involved in casting technology is Mannesmann Demag Wean, a joint venture of Mannesmann Demag and Wean United, Inc. The new company will engineer and market a line that includes continuous casters, bar mills, and tube mills.

"The biggest advantage we get is the transfer of technology," says George M. Baughman, president of the new affiliate and a long-time officer of Wean United.

Technology is important today, but there is something more important. "Everybody's talking about the financing," says Mr. Klingelhoefer of Mannesmann Demag.

There is no question recent contract awards have hinged on financial terms. Steel companies have been offered unsecured, low interest loans. The continuous casters Voest Alpine is supplying Bethlehem Steel will have payments based on usage.

The Japanese and the Europeans have been giving the most liberal terms. This has had the effect of freezing American builders out of the manufacturing end of the work.

"The biggest problem with financing is that the equipment is restricted to certain countries," says Mr. Klingelhoefer.

The trend is toward a single financial package. Until recently, there were low interest loans for the 'soft' portion of a project—the infrastructure work. Higher rates were charged on the 'hard' or commercial portion.

On recent steel projects in Mexico, no distinction was made between the hard and soft parts. The same treatment is being asked for the Phillipine steel project.

Horizontal continuous casting has reached the commercial stage. At the AISE show, Nippon Kokan displayed its Horicast system. Developed in conjunction with Davy Loewy, this is now being used for billet casting in five plants.

In this country, Armco Inc. is installing a continuous caster of Technica Guss at Baltimore. Voest Alpine and Mannesmann Demag are among the others working on horizontal casters.

This appears to be another development that will initially fit in the mini-mill picture. "I see a future for some special products," says Guenter Wollenweber, manager of continuous casting for Mannesmann Demag Wean.

(Cont. on p. MP-10)

Capital Spending & Material Supply Services

(In Millions of Dollars)

Year	Capital Spending*	Material Supply Services*
1982	$4,219.4	$32,722.1
1981	3,365.3	34,721.9
1980	3,389.6	30,393.7
1979	3,311.9	31,380.4
1978	2,595.2	27,494.5
1977	2,850.3	22,096.4
1976	3,252.9	19,175.7
1975	3,179.4	17,373.6
1974	2,114.7	19,900.3
1973	1,399.9	14,450.5

*1981 and 1982 data represents consolidated reports of steel industry companies who produced 82.1% of the reported raw steel production in 1982.

Source: AISI

By special, Mr. Wollenweber means either expensive alloys or reinforcing steels in limited quantities. He doesn't see the horizontal caster being used for large quantities of billets or slabs.

"The horizontal caster will not replace the tonnage caster," he states.

A dark horse in the horizontal and also the thin slab pictures is the Hazelett strip caster. Widely used in nonferrous work, this proved unsuitable for steel in tests years ago.

Now, a Hazelett research program for steel billets is underway at Krupp in West Germany. There is also said to be a Hazelett steel program in Japan.

Closely tied to continuous casting are direct rolling and hot charging. An AISE paper by Nippon Steel Corp. reported that over 90 pct of the cast slabs at Oita Works are being rolled or charged without conditioning. Nippon Steel attaches considerable importance to the use of a powerful sizing mill at Oita. This is a big help in stabilizing casting operations.

Two of the AISE papers on direct rolling dealt with older plants rather than new ones. Working with ingots, Dofasco, Inc., has long used direct rolling.

The Fairless Works of U.S. Steel was designed for direct rolling, but this practice was used only to a minor extent until recently. When fuel costs zoomed, Fairless returned to non-stop rolling of ingots. For the past year and a half, the plant has direct rolled 80 to 90 pct of its steel.

At one time, there was talk that U.S. Steel would go to continuous casting at Fairless and use soaking pits for partial reheating of thick slabs. The idea died when U.S. Steel added up the cost of modernizing the whole hot end at Fairless.

The obvious advantage of direct rolling (or hot charging) is that it reduces fuel consumption. As the papers brought out, this practice also has the advantage of reducing the gage variations caused by skid marks.

The first tonnage facility designed from scratch for direct rolling will probably be at the Pohang Iron & Steel Co., Ltd., in South Korea. For its big expansion program, Pohang has reportedly specified that the caster must be able to deliver slabs directly to the strip mill. An insulating chamber may be provided to balance temperature, but there will normally be no reheating or conditioning.

Another novel feature reportedly planned for Pohang is the location of the caster at the strip mill rather than in the melt shop. It's a lot easier to transport a ladle of steel than a bunch of individual slabs, says one engineer. This approach might make sense in the U.S. where strip mills and melt shops are often too far apart for direct processing.

With the prospect of a continuous flow from caster to rolling mill, it's interesting that continuous steelmaking has surfaced again. After a flurry of activity 10 or 15 years ago, most people gave up on the idea of a continuous refining process.

Now, the concept has been revived by Mitsubishi Heavy Industries, Ltd. At Shimizu Seiko Co. in Japan, a continuous system designed for 15 tons an hour has been in operation since 1982.

The system first melts scrap in a cupola. There are then successive desulferizing, refining and grading steps. The need to produce different grades is one of the things that has always made steelmaking a batch operation. Mitsubishi evidently feels chemistry changes can be made without halting the continuous flow.

Mitsubishi's use of a cupola is not entirely novel. A number of U.S. companies tried making iron in hot blast cupolas. Results were not encouraging. Allegheny Ludlum Steel Corp., for one, switched to induction furnaces after many years of cupola operation.

In the rolling mill area, there is a broad new push for better shape control. An ASEA control system has been installed on a cold mill of Republic Steel Corp. at Warren, Ohio. Two Davy McKee unit has been ordered by Bethlehem Steel for Burns Harbor, Ind.

The Bethlehem installation will be tied in with the inflatable rolls of Blaw-Knox Co. (Sumitomo uses the term, variable crown, for its roll.) There is interest in the inflatable roll for both hot and cold mills.

At Burns Harbor, the flatness measuring system of Selective Electronic, Inc., is going on the hot strip mill. This will be used initially just for monitoring; there will be no direct feedback to the mill.

The trend toward scaled-down technology was underlined at AISE when Dravo Engineers, Inc., revealed that it will be supplying the Neuval process of Vallourec. One variation of this process is designed for rolling seamless tube in small quantities—100,000 to 200,000 tons a year.

In Youngstown, Hunt Steel is using a Schloemann planetary mill for elongation and Kocks mill for stretch reduction of seamless. The Hunt plant is designed for 400,000 tons a year, but it follows the mini-mill concept. ☐

Reprints available while supply lasts. For single copy, circle No. 94 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4422.

EFFECTIVE OCTOBER 24, 1983

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	183	182	175	116
Buffalo	9	9	30	30
Pittsburgh	229	229	203	137
Youngstown	113	112	101	67
Cleveland	142	143	133	95
Detroit	134	132	96	103
Chicago	493	487	459	333
Cincinnati	105	94	102	64
St. Louis	79	80	76	55
Southern	147	142	152	61
Western	99	88	95	50
U.S. Production	1,733	1,698	1,622	1,111

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton $32.78
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/25/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective October 24, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,733	1,698	66,655	60,829
Capability Utilization Rate	60.0	58.8	54.7	48.9

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 77.83	$ 77.83	$ 77.50	$ 52.17
No. 2 bundles	$ 46.50	$ 46.50	$ 45.50	$ 39.17
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 82.50	$ 82.50	$ 82.50	$ 54.50
No. 1 steel, Philadelphia	71.50	71.50	70.50	55.50
No. 1 steel, Chicago	79.50	79.50	79.50	46.50
No. 1 bundles, Detroit	81.50	81.50	75.50	44.50
Low Phos., Youngstown	84.50	84.50	84.50	56.50
No. 1 mach'y cast., Pgh	74.50	74.50	74.50	64.50
No. 1 mach'y cast., Phila	95.50	95.50	95.50	98.50
No. 1 mach'y cast., Chi	109.50	109.50	109.50	103.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective October 24, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	68.00-70.00	70.00	10/20/83
Lead	26.00-27.00	25.00-27.00	10/19/83
Magnesium Ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	46.00-49.00	46.00	10/24/83

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.80-$2.00
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$394.50
Indium, dollars per troy oz.	$3.20-$3.50
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$330-$350
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$9.54
Vanadium	$4.94
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Oct. 17—583.42
Oct. 18—585.54
Oct. 19—584.85
Oct. 20—583.30
Oct. 21—582.53

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	67⅛	63
Yellow brass	60	58
Red brass	63⅜	60½
Comm. bronze	63⅞	61¼
Mang. bronze	60¾	58¾
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	61
No. 2 copper wire	52
Light copper	43

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	57
No. 2 copper wire	48
Light copper	39
No. 1 composition	54
No. 1 comp. turnings	51
Hvy. yellow brass solids	33
Hvy. yellow brass turnings	28
Radiators	44

Aluminum

New mixed clips	49	—50
Old sheet	47	—48
Old cast	47	—48
Clean dry borings	47	—48

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	55	—56
No. 2 copper wire	48	—49
Light copper	44	—45
Radiators	36	—37
No. 1 composition	45	—46
No. 1 composition turn'gs	43	—44
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	31	—32
New soft brass clippings	44	—45

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	9	—10

EFFECTIVE OCTOBER 24, 1983

MATERIALS NEWSFRONT

(Effective October 24, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 82.00 to	$ 83.00
No. 2 hvy. melting	72.00 to	73.00
No. 1 dealer bundles	101.00 to	102.00
No. 1 factory bundles (auto)	102.00 to	103.00
No. 2 bundles	51.00 to	52.00
No. 1 busheling	97.00 to	98.00
Machine shop turn.	19.00 to	20.00
Shoveling turnings	44.00 to	45.00
Cast iron borings	43.00 to	44.00
Low phos. punchings plate	99.00 to	100.00
Heavy turnings	72.00 to	73.00
No. 1 RR hvy. melting	99.00 to	100.00
Rails 2 ft. and under	101.00 to	102.00
Scrap rails, random lgth.	91.00 to	92.00
RR specialties	100.00 to	101.00
No. 1 machinery cast	74.00 to	75.00
Cupola cast	67.00 to	68.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	600.00 to	610.00
18-8 turnings	500.00 to	510.00

Chicago

No. 1 hvy. melting	$ 79.00 to	$ 80.00
No. 2 hvy. melting	72.00 to	73.00
No. 1 dealer bundles	98.00 to	99.00
No. 1 factory bundles (auto)	102.00 to	103.00
No. 2 dealer bundles	44.00 to	45.00
No. 1 busheling	97.00 to	98.00
Shredder scrap	85.00 to	86.00
Machine shop turn.	25.00 to	26.00
Mixed bor. and turn.	26.00 to	27.00
Shoveling turnings	31.00 to	32.00
Cast iron borings	44.00 to	45.00
Low phos. forge crop	99.00 to	100.00
Low phos. punchings plate ¼ in. and heavier	109.00 to	110.00
Low phos. 2 ft. and under	105.00 to	106.00
No. 1 RR hvy. melting	94.00 to	95.00
Scrap rails, random lgth.	81.00 to	82.00
Reroller rails	95.00 to	96.00
Rails, 2 ft. and under	102.00 to	103.00
RR couplers and knuckles	92.00 to	93.00
RR car axles	114.00 to	115.00
No. 1 machinery cast	109.00 to	110.00
Cupola cast	97.00 to	98.00
Stove plate	92.00 to	93.00
Steel car wheels	98.00 to	99.00
Stainless		
18-8 bundles and solids	570.00 to	580.00
18-8 turnings	470.00 to	480.00
430 bundles and solids	135.00 to	140.00
430 turnings	100.00 to	105.00

Philadelphia

No. 1 hvy. melting	$ 70.00 to	$ 73.00
No. 2 hvy. melting	60.00 to	63.00
No. 1 dealer bundles	82.00 to	85.00
No. 2 dealer bundles	42.00 to	45.00
No. 1 busheling	82.00 to	85.00
Shredder scrap	86.00 to	89.00
Machine shop turn.	23.00 to	26.00
Mixed bor. and turn.	23.00 to	26.00
Shoveling turnings	39.00 to	42.00
Low phos. 5 ft. and under	87.00 to	90.00
Low phos. 2 ft. punchings	97.00 to	100.00
Electric furnace bundles	100.00 to	103.00
RR specialties	87.00 to	90.00
Rails, 2 ft. and under	100.00 to	103.00
Cupola cast	65.00 to	68.00
Heavy breakable cast	53.00 to	56.00
No. 1 machinery cast	94.00 to	97.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00 to	$ 60.00
No. 2 hvy. melting	57.00 to	58.00
No. 1 dealer bundles	81.00 to	82.00
No. 2 bundles	40.00 to	41.00
No. 1 busheling	79.00 to	80.00
Drop forge flashings	55.00 to	56.00
Machine shop turn.	33.00 to	34.00
Mixed borings and turn.	22.00 to	23.00
Shoveling turnings	33.00 to	34.00
Cast iron borings	33.00 to	34.00
Heavy breakable cast	35.00 to	36.00
Mixed cupola cast	51.00 to	52.00
Automobile cast	74.00 to	75.00
Stainless		
18-8 bundles and solids	470.00 to	480.00
18-8 turnings	350.00 to	360.00
430 bundles and solids	115.00 to	125.00

Youngstown

No. 1 hvy. melting	$ 71.00 to	$ 74.00
No. 2 hvy. melting	49.00 to	52.00
No. 1 dealer bundles	87.00 to	90.00
Ne. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	3.00 to	5.00
Shoveling turnings	7.00 to	10.00
Low phos. plate	83.00 to	86.00
Electric furnace bundles	78.00 to	81.00
Galvanized bundles	70.00 to	73.00

Cleveland

No. 1 hvy. melting	$ 67.00 to	$ 70.00
No. 2 hvy. melting	32.00 to	35.00
No. 1 dealer bundles	85.00 to	88.00
No. 1 factory bundles	97.00 to	100.00
No. 2 bundles	22.00 to	25.00
No. 1 busheling	84.00 to	87.00
Machine shop turn.	1.00 to	4.00
Mixed bor. and turn.	1.00 to	4.00
Shoveling turnings	3.00 to	6.00
Cast iron borings	6.00 to	9.00
Cut structural & plates, 2 ft. and under	100.00 to	103.00
Low phos. punchings plate	100.00 to	103.00
Drop forge flashings	37.00 to	40.00
Foundry steel, 2 ft. & under	57.00 to	60.00
No. 1 RR hvy melting	77.00 to	80.00
Rails, 2 ft. and under	105.00 to	108.00
Rails, 18 in. and under	106.00 to	109.00
Steel axle turnings	67.00 to	70.00
Railroad cast	80.00 to	83.00
No. 1 machinery cast	87.00 to	90.00
Cupola cast	60.00 to	63.00
Stove plate	45.00 to	48.00
Stainless		
18-8 bundles	325.00 to	335.00
18-8 turnings	275.00 to	285.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 58.00 to	$ 59.00
No. 2 hvy. melting	47.00 to	48.00
No. 1 busheling	69.00 to	70.00
No. 1 dealer bundles	69.00 to	70.00
No. 2 bundles	30.00 to	31.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	12.00 to	13.00
Low phos. plate	69.00 to	70.00
Structural and plate, 2 ft. and under	70.00 to	71.00
Rails, 2 ft. and under	84.00 to	85.00
Scrap rails, random lgth.	69.00 to	70.00
No. 1 machinery cast	75.00 to	76.00
No. 1 cupola cast	54.00 to	55.00

St. Louis

No. 1 hvy. melting	$ 69.00 to	$ 70.00
No. 2 hvy. melting	58.00 to	59.00
Foundry steel, 2 ft.	57.00 to	58.00
No. 1 dealer bundles	69.00 to	70.00
No. 2 bundles	55.00 to	56.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	24.00 to	25.00
Cast iron borings	35.00 to	36.00
No. 1 RR hvy. melting	79.00 to	80.00
Rails, random length	76.00 to	77.00
Rails, 18 in. and under	92.00 to	93.00
RR specialties	85.00 to	86.00
Cupola cast	70.00 to	71.00
Heavy breakable cast	48.00 to	49.00
Stove plate	75.00 to	76.00
Cast iron car wheels	49.00 to	50.00
Rerolling rails	97.00 to	98.00
Unstripped motor blocks	57.00 to	58.00

Birmingham

No. 1 heavy melting	$ 67.00 to	$ 68.00
No. 2 heavy melting	64.00 to	65.00
No. 1 dealer bundles	68.00 to	69.00
No. 2 bundles	50.00 to	51.00
No. 1 busheling	68.00 to	69.00
Shredder scrap	94.00 to	95.00
Machine shop. turn.	24.00 to	25.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	33.00 to	34.00
Electric furnace bundles	67.00 to	68.00
Elec. furnace, 3 ft. & under	64.00 to	65.00
Structural and plate, 2 ft.	94.00 to	95.00
Structural and plate, 4 ft.	92.00 to	93.00
No. 1 RR hvy. melting	81.00 to	82.00
Scrap rails, random lgth.	86.00 to	87.00
Rails, 18 in. and under	97.00 to	98.00
Angles and splice bars	94.00 to	95.00
No. 1 cupola cast	87.00 to	88.00
Unstripped motor blocks	64.00 to	65.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 62.00 to	$ 63.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	71.00 to	72.00
No. 2 bundles	30.00 to	31.00
Machine shop turn.	7.00 to	8.00
Shoveling turnings	10.00 to	11.00
Cast iron borings	14.00 to	15.00
Low phos. 18 in. and under	89.00 to	90.00
Rails, random length	70.00 to	71.00
Rails, 2 ft. and under	88.00 to	89.00
No. 1 cupola cast	67.00 to	68.00
Heavy breakable cast	34.00 to	35.00
Drop broken cast	80.00 to	81.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 38.00 to	$ 39.00
No. 2 hvy. melting	34.00 to	36.00
No. 2 dealer bundles	22.00 to	23.00
Mixed bor. and turn.	10.00 to	11.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	13.00 to	14.00
Clean cast. chem. borings	34.00 to	35.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	45.00 to	46.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	70.00 to	80.00
410 solids	60.00 to	70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	35.00 to	37.00
No. 1 dealer bundles	57.00 to	59.00
No. 2 bundles	31.00 to	33.00
No. 1 busheling	57.00 to	59.00
Shredder scrap	57.00 to	59.00
Machine shop turn.	5.00 to	7.00
Shoveling turnings	9.00 to	11.00
No. 1 machinery cast	95.00 to	100.00
Mixed cupola cast	34.00 to	36.00
Heavy breakable cast	8.00 to	10.00

San Francisco

No. 1 hvy. melting	$ 42.00 to	$ 44.00
No. 2 hvy. melting	34.00 to	36.00
No. 1 dealer bundles	29.00 to	31.00
No. 2 dealer bundles	13.00 to	15.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	73.00 to	75.00

Los Angeles

No. 1 hvy. melting	$ 40.00 to	$ 42.00
No. 2 hvy. melting	29.00 to	31.00
No. 1 dealer bundles	27.00 to	29.00
No. 2 dealer bundles	10.00 to	12.00
Machine shop turn.	6.00 to	8.00
Shoveling turnings	10.00 to	12.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	73.00 to	75.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 61.00 to	$ 63.00
No. 2 hvy. melting	50.00 to	52.00
No. 2 bundles	40.00 to	42.00
No. 1 cupola cast	96.00 to	98.00
Mixed yard cast	83.00 to	85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 60.00
No. 2 heavy melting cut 2 ft. and under	57.00
No. 1 dealer bundles	65.00
No. 2 bundles	35.00
Mixed steel scrap	39.00
Bush. new fact. prep'd.	63.00
Bush. new fact. unprp'd.	55.00
Machine shop turn.	30.00
Short steel turn.	33.00
Mixed bor. and turn.	20.00
Cast scrap	53.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 79.00 to	$ 80.00
No. 2 hvy. melting	63.00 to	65.00
No. 2 bundles	41.00 to	43.00
Machine shop turn.	21.00 to	22.00
Crushed turnings	43.00 to	45.00
Shredder scrap	79.00 to	80.00
Cut structural plate 2 ft. and under	94.00 to	96.00
Unstripped motor blocks	57.00 to	59.00
Cupola cast	78.00 to	80.00

STEEL PRICES

Codes identify Producers listed in the Key on page 97. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C8	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C8	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C8	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C8	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C8	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	21.45
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
K1	20.80
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
R7, S10	29.60
P15	24.80
S7	Cmp*
U1	38.30
D1(1)	Cmp*
B4	33.60
Midwest	
G4	24.80
I4	35.30
W14	22.95
S1, J4	34.05
T4	Cmp*
S1	37.05

*Composite pricing

High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, I4, J3, G2, I3	22.05
A7	22.05
S1	23.75
West	
K1	22.05
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge, East	
R7	29.00
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
G4	25.80
I4	23.70
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
R7	32.75
B4	47.25
P15	32.10
Midwest	
I4	41.80
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	21.15
U1, W5, S1, B3	23.75
West	
U1	24.25
K1	22.05
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
K1	27.15
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C8	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
K1	$26.79
U1	28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
K1	$21.99
U1	22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
K1	$24.01
U1	25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7	23.95
U1, I3, I4, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C8	24.45
South	
A8	20.85
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	22.25
B4	31.00
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	19.80
L2	30.75
N9	31.00
P3	19.85+CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	24.85
I3	21.00*
West	
B3	27.95
B5	18.50
C8	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	25.65
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	22.70
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C8, O2	24.25
K1	23.50
U1, B3	25.75
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	30.55
K1	31.30
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C8	24.95

STEEL PRICES

Producer Key
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C8	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P3	Wyckoff Steel Div., Plymouth, Mich.
P9	Pacific States Steel Co., Niles, Cal
P13	Penn Dixie Steel Corp., Kokomo, Ind.
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

Steel Service Center Prices

Price, Dollars per 100 lb

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	23.56	29.54	31.00	31.10	22.41	22.00	17.72	31.83	38.37	50.60	69.58	73.19
Baltimore	25.09	29.89	35.62	40.13	23.60	28.11	20.19	37.78	56.15	65.06	71.57	76.32
Birmingham	23.53	28.18	31.94	31.38	21.86	24.70	17.83	30.94	49.31	68.90	68.16	74.43
Boston	28.40	32.27	35.24	45.18	32.96	30.79	21.20	39.88	47.40	51.70	65.08	71.03
Buffalo	26.29	33.95	38.37	40.89	30.94	27.55	18.16	37.91	40.10	47.82	55.33	63.40
Chicago	26.36	31.74	33.90	35.08	23.41	24.31	16.10	32.98	35.94	40.45	46.33	52.53
Cincinnati	25.55	30.37	33.32	33.65	23.70	24.96	15.68	31.65	36.03	39.87	45.03	49.78
Cleveland	27.21	31.56	34.63	33.62	33.62	24.94	16.96	33.46	35.76	39.98	44.02	50.99
Denver	33.50	39.20	38.65	40.27	31.40	31.40	20.43	44.16	45.17	59.08	66.90	72.22
Detroit	26.48	32.27	34.48	34.60	25.26	26.83	18.26	35.08	35.74	40.44	48.73	52.99
Houston	26.10	31.52	35.30	42.46	30.23	30.05	20.65	41.47	45.85	51.86	56.36	64.71
Kansas City	23.76	28.88	33.66	31.59	23.80	28.84	16.15	38.74	45.33	48.63	52.20	59.20
Los Angeles	26.97	33.40	37.56	47.04	32.50	36.17	29.04	41.14	63.36	70.46	76.95	73.22
Memphis	26.12	33.39	33.91	34.55	27.81	29.81	19.47	37.60	45.09	49.96	59.80	69.44
Milwaukee	25.84	31.39	33.41	32.01	24.12	24.56	15.92	30.87	35.95	40.32	45.23	51.68
New York	25.80	33.21	36.97	44.64	30.83	29.48	20.17	41.14	46.00	51.91	61.12	63.63
Philadelphia	28.57	33.81	38.64	46.98	31.37	29.82	20.12	39.84	48.41	53.60	63.90	70.57
Pittsburgh	29.26	35.44	37.92	41.99	32.98	29.51	20.41	32.56	48.10	53.06	60.27	68.22
Portland	25.66	33.27	38.17	31.11	31.04	34.76	27.50	44.85	49.78	57.74	70.44	....
San Francisco	27.75	34.12	38.15	46.06	33.08	35.40	27.00	39.54	60.16	71.07	78.29	85.66
Seattle	27.74	32.32	36.16	40.49	27.49	30.10	28.45	50.60	63.37	71.57	76.28	87.67
Spokane	21.00	30.34	34.28	37.91	33.00	33.75	21.60	43.01	43.20	47.52	....	58.32
St. Louis	26.01	31.88	34.10	33.95	25.58	24.62	16.61	33.46	37.66	42.41	49.84	56.46
St. Paul	25.72	29.51	32.90	36.25	26.33	24.97	17.70	32.93	36.16	41.16	45.76	52.07

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2^{15}/$_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 3, 35, 37, 41-42,

51, 54, 59-60, 63-66, 121,

123.

Chilton's

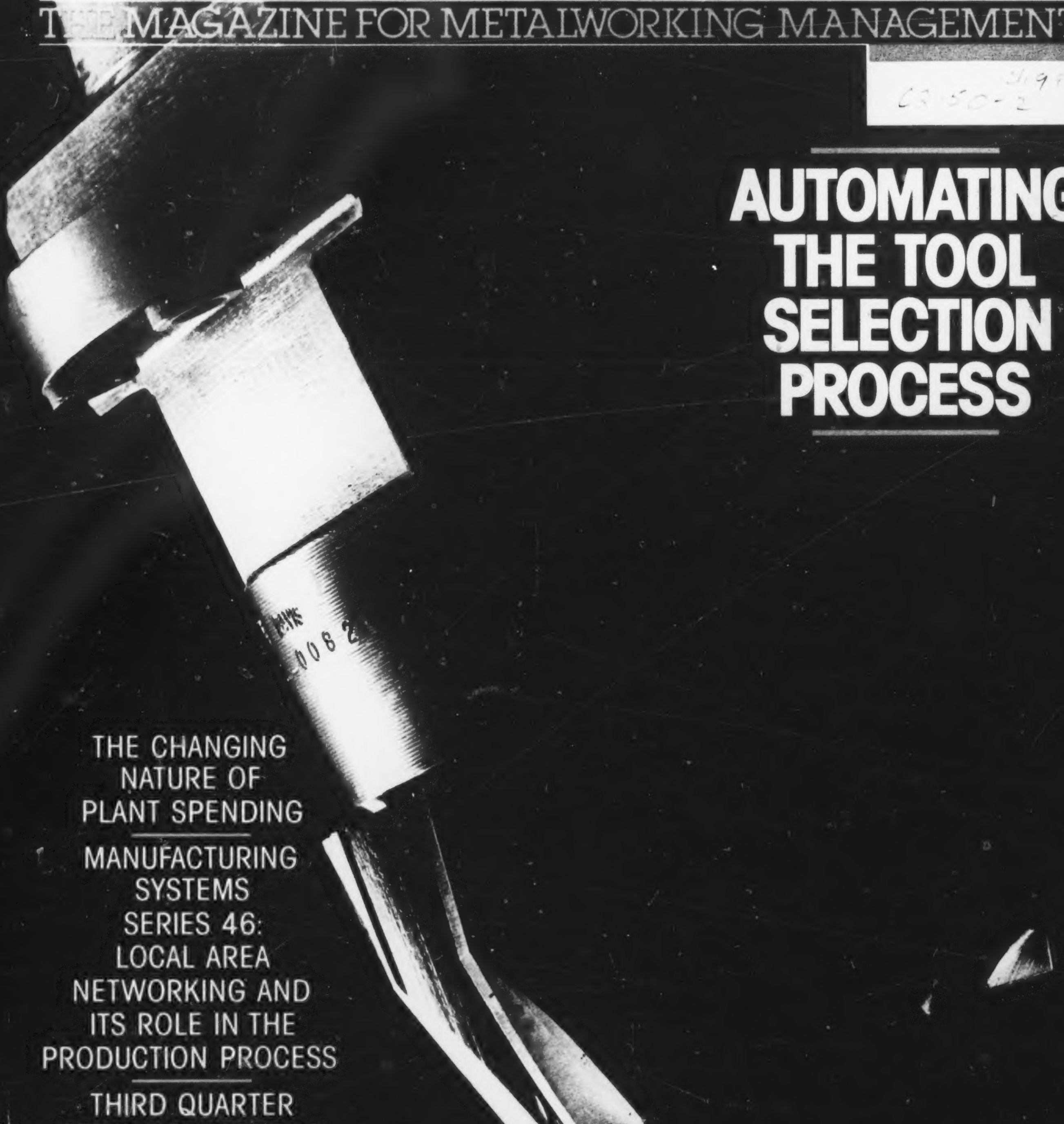
NOVEMBER 25, 1983

IRON AGE

THE MAGAZINE FOR METALWORKING MANAGEMENT

[illegible]
C3150-2

AUTOMATING THE TOOL SELECTION PROCESS



THE CHANGING
NATURE OF
PLANT SPENDING

MANUFACTURING
SYSTEMS
SERIES 46:
LOCAL AREA
NETWORKING AND
ITS ROLE IN THE
PRODUCTION PROCESS

THIRD QUARTER
STEEL/NONFERROUS
EARNINGS

VOL. 226, NO. 28

IRON AGE

NOVEMBER 25, 1983

COVER STORY

98 AUTOMATED TOOL SELECTION PROCESS
This is the key to successful flexible manufacturing systems, but it is a major hurdle for the machine tool industry.

FEATURES

37 STEEL/NONFERROUS BEGIN TO SEE SOME DAYLIGHT
USS posts net profit of $52 million; aluminum starts to shine.

48 A TOUGH BATTLE IS BEING WAGED TO CONTROL KAISER STEEL
Company stockholders hold the key to resolving the fray.

51 $100 BILLION TRADE SHORTFALL POSSIBLE IN THE 1980s
Commerce Secretary Malcolm Baldrige sees one way to curb imports—increase exports.

63 PLANT OUTLAYS SHIFT IS CRITICAL TO METALWORKING
Investments in hi tech and services hurt basic goods lines.

71 ROBOTS TAKE STRAIN AND PAIN FROM WORK AT KAISER
Most workers support the change to automatic equipment.

79 MMS SERIES 46: LOCAL AREA NETWORKS
Networks are critical to tomorrow's factory. But they're under-utilized due to lack of awareness, money and standards.

NEWSFRONTS

7 EDITORIAL
Why don't they 'fess up and say so?

20 METALWORKING NEWSFRONT
Dumping charges are filed against Latin American steelmakers.

35 BUSINESS FINANCEFRONT
No credit crunch through early '84, says a top bank.

60 METALWORKING ORDER TRENDS
Durable goods orders continued at a stronger pace in September.

62 YOU AND YOUR JOB
Cause stress and you may get a taste of your own medicine.

77 TECHFRONT
Cabot's nickel-based alloy protected by a surface film.

94 MMS PRODUCTS
Microprocessor-based field transmitters users can count on.

111 PRODUCTS NEWSFRONT
Charmilles Technologies unveils new dimension in wire EDM.

115 MATERIALS NEWSFRONT
Sheet prices increases are likely in the first quarter of 1984.

126 BUSINESS FORECAST
American consumer confidence is at its highest level in 10 years.

DEPARTMENTS

8 EDITORIAL STAFF
18 LETTERS
32 PEOPLE ON THE MOVE
33 INDUSTRIAL BRIEFS
107 FREE LITERATURE
116 BUSINESS STAFF
116 AD INDEX
117 MANAGEMENT SERVICE CARD
121 P&P DATA 11/14
123 FERROUS SCRAP 11/14
125 CLEARING HOUSE

NEXT ISSUE

GM 75

GM at 75: The making of a giant.

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089, appearing on the first Monday and third Friday each month. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

BUSINESS FINANCEFRONT

Buying back their own stock usually works well for companies

There is one corporate strategy of recent years that is taking on more depth if not more breadth. That is the practice of companies buying back their own stock.

A recent study by The Conference Board found that the number of companies repurchasing their own stock has remained "fairly stable." But the board found that the total volume of shares bought back has swelled.

The study found that 297 companies listed on the New York Stock Exchange (NYSE), bought back 218.9 million shares of their common stock in only the first 10 months of 1982. This was up sharply from the 148.4 million shares bought back by some 312 companies in all of 1981. It was also up from the 101.3 million shares bought in 1980.

In an in-depth survey of 72 companies--all NYSE-listed--board analysts dug for reasons behind the buy-back wave. Each of these selected 72 companies had been big buyers of their own common stock during each of the preceding five years.

Corporate Stock Repurchases

	1982	1981	1980
	(10 months)		
No. of Companies	297	312	305
Shares Bought (millions)	218.9	148.4	101.3

Source: The Conference Board

"The sharp increase in 1982 volume," says Conference Board research consultant Francis A. Lees, "undoubtedly reflected the generally depressed conditions of the stock market prices prior to the recovery that began in August 1982, and it demonstrates the determination of many repurchasing companies to exploit favorable buying opportunities."

The chief reason companies buy back their own stock is to be able to use it in their compensation, stock option and employee stock purchase plans. More than half of the companies ranked this purpose as No.1 in importance.

Three other objectives were named by companies. One was to "exploit favorable investment opportunities." As board experts note, "most companies try to time their purchases to take advantage of what they believe are bargain market prices.

Another stated purpose of stock repurchases is to improve earnings-per-share. When stocks are bought back and put in the company treasury, the shares are not counted as 'outstanding,' so they are not included in determining per-share earnings data.

Still another purpose in buying back stock is to provide wherewithal, other than cash, for any acquisitions a company might make. As the board notes, companies often acquire other companies by offering shares of their own stock in exchange for the shares of other companies.

No credit crunch likely this year--but look out!

Where is the big credit market crunch that is supposed to be imminent--or even here by now?

Government financing of the record Federal budget deficit was supposed to meet head-on with big recovery-time borrowing by business and consumers.This earth-thumping confrontation would then send interest rates soaring. After all, with all sectors of the economy then desperately needing money, those who had it to lend could charge premium interest rates.

A this time, the Federal budget is still in the red by some $200 billion and economic recovery is a full year old. But interest rates are showing no signs of a strong run-up.

The fact is that the big borrowing face-off never came about. At least, not yet.

Analysts at Morgan Guaranty Trust Co. have taken a hard look at the entire credit scene and have found four key reasons for the present "renewed optimism in credit markets."

They cite a cooling off from an earlier torrid pace of recovery, some reduction in the volume of government financing, lackluster business credit demand and slower growth in money supply.

In a credit market sector-by-sector analysis by Morgan analysts (see table), they conclude that the market "will be able to handle new credit demands without strain into early 1984 in an environment of fairly stable interest rates."

Then they drop the 'other shoe.'

"By late 1984, the Treasury's still voracious appetite for funds seems likely to coincide with more robust growth in private-credit needs. At that point, congestion could become a concern for credit markets."

If any credit market congestion occurs between now and early next year, it won't likely be due to expanded borrowing by business. Morgan analysts note that plant investment and inventory building is running slightly below what is typical in an early recovery period. At the same time, corporate cash flow has "risen more rapidly than had been expected, as profits of nonfinancial corporations have soared—up nearly 54 pct at an annual rate in the first half of 1983."

The Borrowing Breakout

	Billions of Dollars		
	1982	1983	
	2nd Half	1st Half	2nd Half
Federal Government	$119.7	$102.6	$89.0
State & Local Govt.	30.6	28.2	21.0
Corporate	25.4	9.3	19.0
Mortgages	42.7	69.0	75.0
Consumer	16.6	10.2	16.0
Other	4.3	9.8	7.0
TOTAL	$239.3	$229.1	$227.0

Source: Morgan Guaranty Survey

But the analysts warn that as recovery matures into a business expansion period, business credit needs will swell at the same time as their earnings gain moderately. The government at that time will still be borrowing big.

So, what they are saying is, 'OK for now, but watch out for late 1984.'

The only thing is, that seems hard to believe for an election year.

STEEL/NONFERROUS BEGIN TO SEE SOME DAYLIGHT

U.S. Steel posts net profit of $52 million to pace steel. Aluminum begins to shine. Copper, lead, zinc and nickel still falter.

BY GEORGE J. MCMANUS AND ROBERT J. REGAN

Steel

Third quarter financial returns of steel companies were mildly encouraging.

That is not to say the quarter was a good time for steel. Shipments were down from the second quarter. Price cutting intensified. In many ways, the quarter was a disaster and a disappointment.

What's encouraging however, in a worsening market, is that the industry appeared to turn the corner on profitability. United States Steel Corp. and National Intergroup, Inc., made money in the third quarter.

Also in the black were Carpenter Technology Corp., Nucor Corp., Interlake, Inc., and Laclede Steel Co. Others lost money but in most cases, the losses were down from the second quarter and from the third quarter of 1982.

Obscured by the red ink and skimpy profits was the effect of massive cost cutting throughout the industry. With improved volume and better prices, this effect could come through in dramatic fashion.

Volume is now rising. Steel shipments will go from about 16.5 million tons in the third quarter to as high as 18.5 million tons in the fourth quarter. The price outlook is less optimistic. Steel producers aren't sure when they can dig themselves out of the discounting now underway.

One of the pleasant surprises in the third quarter was U.S. Steel's net profit of $52 million. U.S. Steel got a big lift from Marathon Oil. Third quarter oil and gas operating income of $466 million was up by $176 million from the second quarter.

Inventory liquidation, tax benefit sales, and asset sales also had a favorable impact. However, there was a significant efficiency gain in steel. The operating loss of the steel segment was down by $150 million from the third quarter of 1982.

"We anticipate continued favorable effects from our cost cutting efforts in steel...," said David M. Roderick, chairman of U.S. Steel.

The net loss of Bethlehem Steel Corp. fell from $208 million in the third quarter of 1982 to $59 million in the third quarter of 1983. Bethlehem's operating losses in steel were down sharply in the third quarter and the first nine months of 1982.

LTV Corp. had a net loss of $49.7 million in the third quarter. This was down from the second quarter and from the third quarter of 1982. However, LTV's nine-month loss of $188 million was up from $56.8 million in the first three quarters of 1982.

LTV said demand for tubular products is low but shows signs of improvement. For the first time since 1981, sales of energy products were up in the third quarter (22 pct). The number of drilling rigs at work rose from 1,800 in April to 2,300 at the end of September.

National Intergroup had a net profit of $18.2 million in the third quarter. There was an operating profit of $10.8 million on steel. National also benefitted from profits in aluminum, financial services and other divisions.

Armco Inc. had a net loss of $421.5 million in the third quarter. Of this, $297 million came from special charges resulting from the shutdown of Houston operations. Another $61 million was from the write-off of earlier facility shutdowns.

Armco made money on its carbon and specialty steel businesses in the third quarter. "The flat-rolled carbon steel plants are running at a very high rate because of the strength in the auto and appliance markets and prices are firming," said Harry Holiday, Armco chairman.

In a switch from earlier times, Armco reported depressed results in its oil country business. There was also a loss in financial services.

The net loss of Republic Steel Corp. fell from $74.5 million in 1982 to $35 million in the third quarter of 1983. Republic picked up a non-taxable gain of $20.6 million from the early retirement of a long-term debt.

The effect of price cutting was highlighted by E. Bradley Jones, chairman of Republic. "While nine month shipments this year were practically identical to the 1982 level," said Mr. Jones, "sales were down over 13 pct, reflecting extremely severe price deterioration in the marketplace and an unfavorable product mix."

Inland Steel Co.'s third quarter loss of $21.2 million was down from the second quarter and from the third quarter of 1982. "The continued low demand for bar, structural and plate products, and the accompanying price weakness across all products, were major contributing factors to the company's loss," said Frank W. Luerssen, Inland chairman.'

The company also referred to special cost problems arising from demand for wide sheet products. "Price realization is improving," Inland said.

Wheeling-Pittsburgh Steel Corp. lost just under $9.9 million in the third quarter. Results included $11 million from the sale of tax benefits. Even without this, the loss was down from 1983.

"There has been an improvement in the volume of orders for the fourth quarter, and prospects that this will continue into the first quarter of 1984 are encouraging," said Dennis J. Carney, chairman of Wheeling-Pittsburgh.

Carpenter Technology Corp. contin-

Steel Cuts Its Losses

3RD QUARTER PROFIT REPORT—1983—Millions of Dollars

	Earnings				Sales		
	E/S Pct	3rd Q '83	3rd Q '82	Pct Change	3rd Q '83	3rd Q '82	Pct Change
USS	1.1	52.00	(82.00)	—	4,593.00	4,523.00	+1.5
Bethlehem	—	(59.70)	(208.90)	—	1,221.80	1,195.70	+2.2
Armco	—	(421.50)	(122.60)	—	1,030.50	1,202.90	−14
National	2.7	18.21	(92.56)	—	678.56	797.17	−15
Republic	—	(35.26)	(74.56)	—	677.56	592.76	+14
Inland	—	(21.25)	(45.14)	—	787.42	676.38	+16
LTV	—	(49.70)	(58.30)	—	1,173.70	1,011.50	+16
Total	—	(517.20)	(684.06)	—	10,162.54	9,999.41	+1.6
Cyclops	—	(2.17)	(1.47)	—	259.55	222.67	+16
Interlake	3.4	6.82	1.39	+391	201.32	183.08	+9.9
Wheel-Pgh	—	(9.89)	(26.02)	—	186.71	193.97	−3.7
Carpenter	2.6	2.69	(0.33)	—	102.70	86.81	+18
Lukens	—	(4.73)	0.33	—	85.07	117.29	−27
Copperweld	—	(6.30)	(9.13)	—	80.74	74.52	+8.3
Quanex	—	(0.01)	(5.64)	—	76.20	63.51	+20
CF&I	—	(13.02)	(12.01)	—	62.51	65.48	−4.5
Laclede	2.2	1.09	(0.46)	—	48.96	42.86	+14
Eastmet	—	(3.51)	(1.78)	—	47.61	37.03	+29
Phoenix	—	(6.16)	(10.02)	—	25.75	22.54	+14
Nucor	5.1	7.36	5.99	+20	145.19	121.11	+20

. . . Nonferrous Still Mixed Profit Picture

Millions of Dollars

	Net Income			Net Sales		
	3rd Q '83	3rd Q '82	Pct Change	3rd Q '83	3rd Q '82	Pct Change
Alcan	$27.0	($15.0)	—	$1,323.0	$1,194.0	+10.8
Alcoa	57.7	(14.4)	—	1,393.7	1,145.2	+21.7
Amax	(52.2)	(97.1)	—	548.5	517.1	+6.1
Asarco	2.9	(56.8)	—	386.8	329.1	+17.5
Brush Wellman	6.4	3.2	+100.0	61.1	44.8	+36.4
Cominco	(17.7)	(19.8)	—	305.9	278.0	+10.0
Engelhard	19.1	17.1	+11.7	397.1	533.2	−25.5
Falconbridge Ltd.	13.7	(26.9)	—	136.6	110.2	+24.0
Hecla Mining	7.7	2.4	+220.8	22.8	13.0	+75.4
Inco	(72.1)	(66.4)	—	265.4	233.2	+13.8
Kaiser Aluminum	(36.8)	63.3	—	723.7	897.0	−19.3
Martin Marietta	33.1	38.0	−12.9	983.9	892.0	+10.3
Newmont Mining	16.8	8.8	+90.9	191.2	158.7	+20.4
Noranda Mines	(7.3)	(50.6)	—	788.1	678.4	+16.2
Olin	13.0	11.2	+16.1	486.3	433.9	+12.1
Phelps Dodge	(28.4)	(26.3)	—	236.9	206.3	+14.8
Revere Copper	4.8	(20.0)	—	121.5	123.6	−1.7
Reynolds Metals	17.9	(11.6)	—	893.9	762.5	+17.2
Vulcan Materials	20.7	18.0	+15.0	233.8	198.3	+17.9

( ) denotes loss

Aluminum Co. of America: Net for the 1983 period includes inventory profit of $16.5 million, a non-recurring gain of $9.7 million from exchange of common stock for debentures and nonrecurring charge of $4.6 million relating to permanent closing of an electrical conductor plant. **Amax Inc.:** Net loss for the 1982 period includes a nonrecurring loss of $8.1 million on sale of oil and gas interests. **Asarco Inc.:** Net loss for the 1982 period includes a $51,129,000 charge relating to Chapter 11 filing of Revere Copper & Brass Inc., 33 pct-owned by Asarco. **Brush Wellman Inc.:** Net for the 1982 period includes a $381,000 loss from discontinued operations. **Cominco Ltd.:** Canadian funds. **Falconbridge Copper:** Canadian funds. **Falconbridge Ltd.:** Canadian funds. Net for the 1983 period includes an extraordinary credit of $14,816,000; operating loss was $1,107,000. **Hecla Mining Co.:** Net for the 1983 period includes an extraordinary credit of $2,266,000. **Martin Marietta Corp.:** Net for the 1983 period includes a pre-tax gain of $20 million on sale of assets. **Noranda Mines Ltd.:** Canadian funds. **Revere Copper & Brass Inc.:** Net for the 1983 period includes a tax-loss carry-forward of $462,000. **Kaiser Aluminum & Chemical Corp.:** Liquidation of certain LIFO inventory decreased net loss by $14.6 million. Net for the 1982 period includes nonrecurring gain of $180.6 million on sale of natural gas rights.

ued its profitable ways in the third quarter. Earnings of $2.7 million were up from a loss of $330,000 in the third quarter of 1982. Carpenter's unit volume was up 31 pct from 1982, even though a continued lag was reported in the capital market.

Laclede Steel also continued to make money. Laclede's profit of $1.1 million in the third quarter compared with a loss of $461,000 in the third quarter of 1982. On Oct. 11, Laclede entered into an agreement which will increase the ownership position of Ivaco Inc. to 51 pct. For $10.1 million, Ivaco will purchase over 494,000 shares of newly issued common stock. Ivaco has had a 40 pct interest in Laclede.

Nonferrous

The business recovery of 1983 was more evident on the top line of third quarter reports of leading nonferrous metals companies, where the sales and other revenues are entered, than it was on the bottom line, where it counts.

The profits tally showed varying degrees of improvement against a horrid 1982 showing, but in most instances it was either a case of showing a small profit against a loss in the third quarter last year or a smaller loss this time around. Satisfactory rates of return on sales or investment were conspicuous by their absence.

With the business recovery confined mainly to the consumer sector, the chief beneficiaries were the aluminum companies, which have a big stake in this market. There wasn't much life in the capital goods sector, which meant a negative impact on results of the nickel, copper and molybdenum producers.

Aluminum prices continued to improve in the third quarter, particularly for ingot and other unwrought forms, but there also was some improvement in selected mill product sectors. Ingot shipments by the U.S. comapnies this year are running about even with the 1982 pace, however, while mill product shipments are up about 14 pct.

Can stock remains a fairly strong market and higher domestic passenger car production also is helping build the aluminum producers' shipment volume. Can stock prices were increased during the summer and industry officials said the higher prices were holding up well, with imported material also priced higher around the same time.

Domestic primary aluminum production has been rising steadily since last February, but going into the fourth quarter, the producers still were trailing the 1982 pace by 6.3 pct. The industry managed to trim its unwieldy inventory by about 15 pct in the first three quarters and the producers do not expect the trend to reverse itself even with continued increases in production through the balance of the year. Industry order bookings were down in September from a fairly strong-August showing, reflecting mainly a drop in orders for can stock - which had been up sharply the month before.

Aluminum Co. of America, which expects to have its domestic smelters up to 99 pct of capacity before the end of the year, tied shipment gains to the business recovery and inventory rebuilding by customers. Reynolds Metals Co. said the automotive, construction and consumer durable markets were holding up well and only the defense, aerospace and capital goods sectors were lagging.

Domestic aluminum production continues to rise steadily. Inventory levels are trimmed 10 pct.

Alcan Aluminum Ltd. said world aluminum demand should show an 11 pct gain this year, of which nearly 70 pct will represent a gain in real consumption and the rest pipeline refilling.

Kaiser Aluminum & Chemical Corp. said the $60 million operating sustained by its aluminum division in the third quarter was well below the approximately $100 million losses experienced in previous quarters. The company said it expects its aluminum operations will begin moving back into the black early next year and that gains by other divisions should offset a smaller operating loss anticipated for the aluminum division in the current period.

Kaiser's third quarter shipments were down 13.2 pct from the same 1982 period at 206,900 tons and nine-month shipments were off only 7.6 pct at 592,100 tons.

Copper shipments by U.S. producers are down because key markets, such as capital goods and the electric utilities sectors, continue to lag. Copper prices are down for the same reason, plus the adverse effect of excess production abroad on hedge market prices. The U.S. cathode price averaged 77.5 cts a lb in the third quarter, a level which, although higher than the same 1982 period, still doesn't clear production costs for most domestic companies.

Phelps Dodge Corp. pinned its operating loss for the third quarter on strikes at its Arizona facilities and the El Paso refinery, plus low copper prices. The copper price went lower as the fourth quarter got under way against the background of general concern about interest rates and their effect on residential construction, lacklustre demand and continued high inventories on the metal exchanges.

Amax Inc. narrowed its losses in the third quarter, citing better prices for aluminum and silver and improved margins on nickel. The gains were more than offset by increased losses from molybdenum operations and the effects of a strike on its Australian iron ore operations.

Mine production of copper by Phelps Dodge dropped to 64,500 tons from 73,400 tons in the preceding period. The company's properties continued to operate during the strike, but normal operating levels were not restored until late in the third quarter. The largest unit, at Morenci, Ariz., was completely down for 10 days in August because of the labor dispute. The company's manufacturing units managed a $700,000 operating profit, compared with a $2.9 million operating profit in the third quarter last year, but all other segments were in the red.

Asarco Inc. squeaked out a small profit (before preferred dividend requirements) on a 17.5 pct increase in dollar sales with an assist from higher silver prices and higher copper prices compared with the third quarter last year.

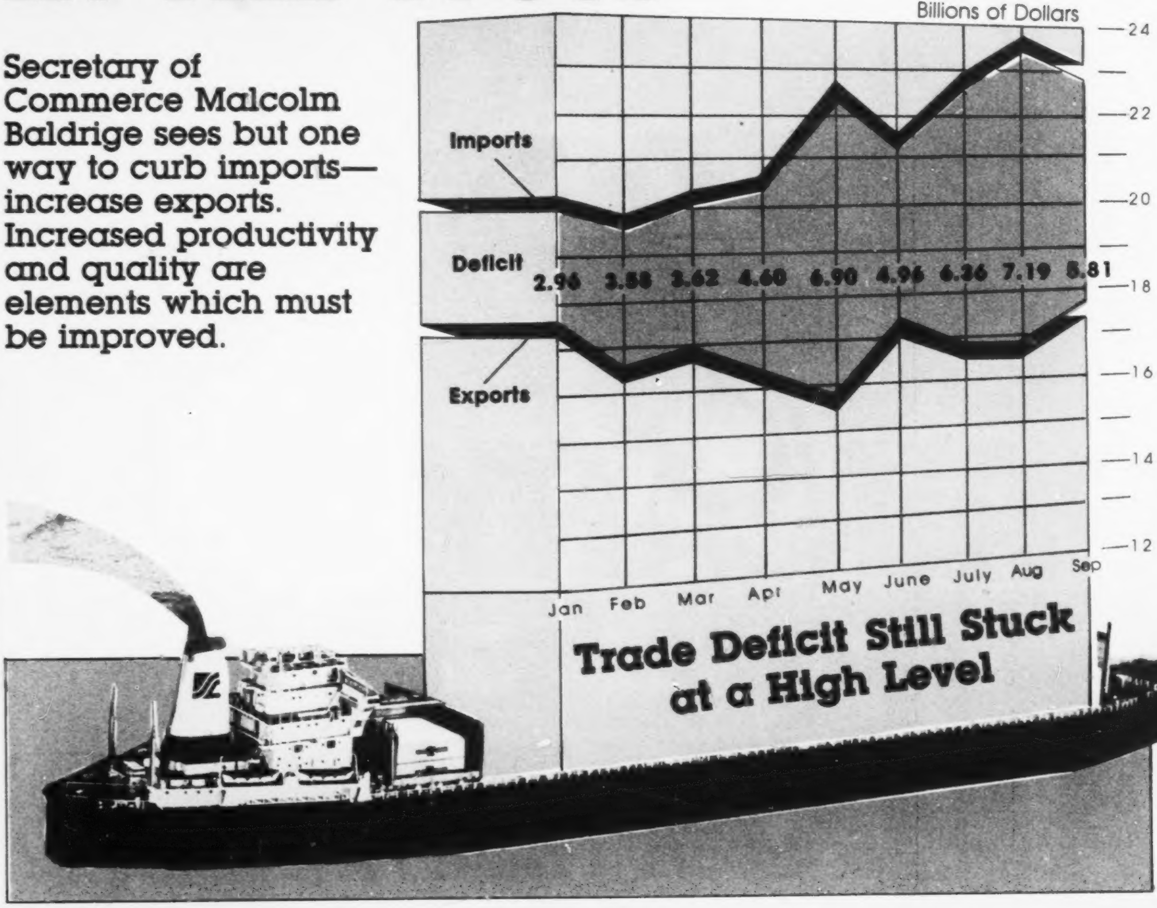
Asarco said consumer-related markets for nonferrous metals "have responded to the economic recovery, but the capital goods sector, which accounts for more than 50 pct of copper consumption, has not."

Inco Ltd. tied a wider loss in the third quarter to "unusual tax adjustments totaling approximately $25 million relating both the prior years, principally Canadian mining taxes, and to a reduction in the effective rate of tax relief expected for the year 1983." Inco said prior quarter results were not restated to recognize the changes in the estimated tax rate and they were recorded in the third quarter results. Inco's third quarter nickel deliveries rose to 63 million lbs from 47 million lbs in the same 1982 period. Copper and silver shipments also gained, but platinum ground metals and gold shipments were down sharply. The company said its inventory of finished nickel products entered the fourth quarter at 69 million lbs, compared with 106 million lbs held at the start of the year.☐

Reprints available while supply lasts. For single copy, circle No. 95 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4423.

$100B TRADE SHORTFALL POSSIBLE IN THE 1980s

Secretary of Commerce Malcolm Baldrige sees but one way to curb imports—increase exports. Increased productivity and quality are elements which must be improved.



BY EDWIN W. BOWERS

As with its massive budget deficit, America cannot survive with a massive trade deficit. The size of the shortfall and its potential—$31 billion last year and, possibly, $100 billion by 1990—is described by many, including United States Steel Corp. Chairman, David Roderick, as "appalling."

Currently the U.S. imports 18 pct of its steel, 27 pct of its machine tools, 28 pct of its autos and 55 pct of its consumer electric products.

Secretary of Commerce Malcolm Baldrige, in an interview with *Iron Age* asserts "the U.S. has to increase its productivity and quality" if it hopes to compete internationally. "There's no way we can compete unless our businessmen are able to respond to that challenge. You can't export more unless you're competitive."

Secretary Baldrige sees increasing exports as the best route to lowering the trade deficit. Mr. Roderick, in a speech in Washington, said the "appalling" prospect of a $100 billion trade deficit before this decade ends "can only be avoided if we, as a nation, insist—which we have not done—that the dollar be kept properly aligned with the currencies of our major trading partners, and that our trade laws be enforced so that the unfair advantage accruing to dumped and subsidized imports is negated."

"Certainly a major factor is the strength of the dollar in relation to the rest of the world's leading currencies," says Secretary Baldrige.

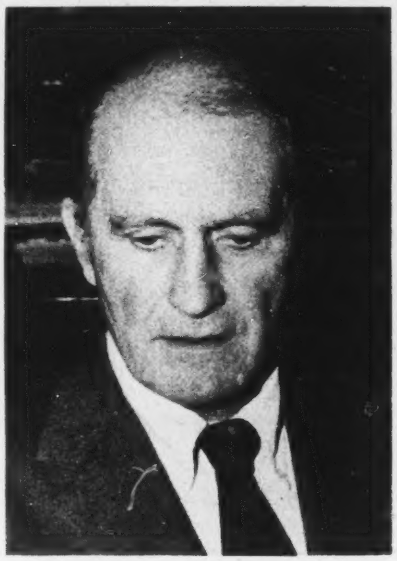
At a trade symposium in Washington, New York University economics professor Melvyn Krauss, claimed the strength of the U.S. dollar can have a positive effect domestically in that it forces U.S. industries—in order to cut costs—to streamline their operations and labor forces.

"That's true of course," says Secretary Baldrige. "But the harmful effects are proportionately greater. We have enough competitive influences to force U.S. businesses to become competitive without having the dollar 20 to 30 pct overvalued. We don't need that to make us realize that we have to become more competitive."

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1982

Millions of U.S. Dollars

	Production Total	Exports	Imports
Japan	$3,794.8	$1,263.4	$ 220.3
United States	3,744.3	574.6	1,217.7
FRG (West Germany)	3,504.9	2,129.0	509.6
Soviet Union	2,934.0	245.0	960.0
Italy	1,138.6	639.9	208.6
GDR (East Germany)	808.0	642.0	197.0
Switzerland	768.4	714.0	157.7
United Kingdom	735.5	436.0	404.4
France	622.1	295.0	479.3
Rumania	615.5	144.5	197.5
PRC (China)	470.0	25.0	130.0
Czechoslovakia	438.8	329.1	112.7
Yugoslavia	303.8	95.6	101.8
Spain	260.2	175.5	176.7
Poland	280.0	120.0	140.0
Canada	221.5	154.5	328.7
Sweden	179.8	138.5	151.2
India	211.3	26.4	105.7
Bulgaria	221.0	219.7	273.0
Brazil	210.5	20.8	111.3



"We estimate that every billion dollars worth of exports represents 25,000 jobs."

Malcolm Baldrige,
Secretary of Commerce

"Each industry and the country as a whole has to be sufficiently determined to do what is necessary to really compete for the markets and jobs to which it aspires," says Westavco Corp. President John A. Luke. "The country needs an ongoing, firmly coordinated and clearly articulated world trade policy that speaks to both market access and product subsidy," he asserts.

"Without question," says National Machine Tool Builders' Association (NMTBA) President James A. Gray, "this country needs a clear-cut, foreign trade policy that business can count on now and well into the future."

Mr. Baldrige looks at trade and sees jobs, both here and abroad. "A deficit of about $60 billion is a major factor on employment in the U.S.," he says. "We estimate that every billion dollars worth of exports represents 25,000 jobs. Looking at it from the other side, the incredible amount of imports the U.S. is taking in represents a lot of employment overseas and, thus, development of other nation's economies. It's possible that as their economies begin to take off and catch up with our rate of growth, they will use more of our exports and that will tend to even things up. So the deficit can perform a function of getting other countries' economies started."

Others look at trade and the deficit and they see politics and legislation. It is likely trade, protectionism, exporting and importing will become major issues in next year's elections. In response to a query from the press whether Congress will seriously consider trade legislation in an election year, Mr. Roderick replied: "Probably more so than in a non-election year."

Says Rep. Richard T. Schulze (R., Pa.), "Our trade laws simply do not do what the Congress intended that they do."

Rep. Bobbi Fiedler (R., Calif.) is calling for policies that "ensure that business—especially small business—is provided with adequate trade remedy laws. Otherwise," she says, "we cannot expect them to be involved in exporting and the resultant job creation that entails."

She has introduced a bill amending the 1974 Trade Act allowing greater Congressional initiative in responding to unfair trade practices by other countries. Rep. Schulze has done the same thing. His bill attempts to allow U.S. companies to prove dumping or injury by adopting a test requiring Socialist countries to sell their products in the U.S. at the lowest price charged in a free market country.

The Senate has passed S-144, a trade reciprocity bill which amends current trade laws to give the Office of U.S. Trade Representative authority to recommend trade sanctions to the President. A similar bill—HR 1571—is pending in the House of Representatives. But Rep. James Florio (D., N.J.), says the measure is on the back burner because there is too much pending legislation in too short a time. Other measures, introduced but expected to get short shrift include the proposed Department of International Trade, reform of the U.S. Domestic International Sales Corps. (DISC) laws, and renewal of the duty-free import program for developing country products.

The Reagan Administration proposed converting the present DISC export tax deferral to an export tax exemption for U.S. offshore affiliates, but the House Ways and Means Committee has no schedule for the measure. Business groups appear split over whether DISC should be revised. They seem to generally favor the White House proposal, many company representatives fear that Congress might react by seriously cutting back the export tax incentive as part of an attempt to raise Federal revenue.

Ways and Means, however, has set off on another route. The Trade subcommittee is trying to develop a bill that would tighten U.S. trade laws against foreign export subsidies and dumping.

It looks like the Congress for the rest of the year will stick to the essentials, in this case, meaning the Administration's $8.4 billion International Monetary Fund bill, renewal of the Export-Import Bank's charter and a renewal of the Export Administration Act. On the latter measure, the House has passed its version, Senate action is pending. The House version restricts the President's authority to curtail exports for national security of foreign policy reasons.

"Trade matters should be considered on their merits rather than on foreign policy considerations," says Mr. Gray. "The latter course does not work."

"If our trade laws are enforced and their rationales recognized by our government policymakers," says Mr. Roderick, "we can compete vigorously for our market and part of the world market."

Concludes Rep. Fiedler: "Today the institution of world trade is faced with a choice. It can either proceed toward protectionism and all the hardship that entails or proceed toward the free system of exports that holds the potential for economic growth for America."

The Washington trade symposium concluded, among other things, free trade and free markets, together with cuts in the Federal deficit, will do more to revitalize the U.S. and world economies than trade barriers or a new "industrial policy."

University of Virginia economics professor, Leland Yeager, asserted the market mechanism is the best way of coping with foreign barriers and other economic interventions by governments.

Secretary Baldrige told *Iron Age* he emphatically agrees with that premise. "The market mechanism is the best way to conduct business—period. Any barriers or economic interventions by governments leads to distortion and ends up causing real trade problems. We must be in the leadership of the effort for free trade around the world. In some cases we simply have to invoke some of our fair trade laws because other countries may be subsidizing, dumping or some of the other examples that are non-market actions. There's no question that we should play a continuing leadership role in the efforts toward freer trade around the world."

The market mechanism may be the best solution, so long as it is not breaking down. Such is the case in steel, argues Mr. Roderick of U.S. Steel.

"The dismantling of the market mechanism in the international steel market is the fundamental challenge confronting the U.S. government's steel trade policy," he says. "The worst possible public policy response to the present steel trade crisis would be to act as if the world market were functioning when we know it is not.

"We are not seeking to prevent competitive trade," he explains, "but rather to promote fair competition. When our trade laws are flaunted, we encourage the wholesale entry of every steelmaking nation into our domestic market without fear of penalty or embarrassment."☐

Reprints available while supply lasts. For single copy, circle No. 81 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4429.

HOW HIGH ARE YOUR EMPLOYEES E.Qs.?

(Economics Quotients)

COULD THEY ANSWER BASIC ECONOMIC QUESTIONS LIKE THESE?

True False

☐ ☐ **(1.)** Less than four per cent of the U.S. labor force are agricultural workers.

☐ ☐ **(2.)** Today, the U.S. ranks third in international trade.

☐ ☐ **(3.)** As productivity increases, our standard of living increases.

☐ ☐ **(4.)** When inflation occurs, each dollar we have buys more goods and services.

A recent national survey shows that many people would find these questions tough. In short, their Economics Quotients, their E.Qs., could probably stand improvement.

A special booklet has been prepared on what makes our American Economic System tick. It's fact-filled, easy reading and free. It's also an easy way for anyone to raise their E.Q.. For your copy, just clip the coupon.

ANSWERS: 1. T 2. F (First) 3. T 4. F

The American Economic System

We should all learn more about it.

Booklets, P.O. Box 1887, New York, N.Y. 10001

_______ Please send me a free copy of the booklet about our economic system.

_______ I would also like a copy of the survey highlights.

Name ____________________ Title ____________________

Company ____

Address ____

City ____________________ State ____________________ Zip __________

Note: Booklets in quantity, posters and other materials are available for use by companies, clubs, etc. For information, write: The Advertising Council, 825 Third Avenue, New York, New York 10022.

Ad Council

A public service message of This Magazine & The Advertising Council & the US Department of Commerce

METALWORKING ORDER TRENDS

Economic recovery continues at sharp, vigorous pace

It looks like American businessmen are bullish on the economy.

Durable goods orders for September indicate the economy is recovering vigorously—perhaps more than anyone expected. Overall, orders received in August totaled $90.3 billion.

That figure was an astounding $17.1 billion better than September 1982, giving an indication of how much the economy has improved over the past 12 months.

Most of the durable goods industries showed increases in new orders in September, but they were partially offset by a large decline in new orders for transportation equipment. In that industry, new orders for motor vehicles and parts declined 14.0 pct in September compared with increases in August and July.

The largest increase in new orders occurred in the nonelectrical machinery category with a jump of $1.9 billion or 12.4 pct.

Also, new orders in September for nondefense capital goods increased for the second consecutive month, up $2.2 billion or 9.5 pct to $25.2 billion.

Durable goods shipments increased by about 2.2 pct or $2.0 billion over August.

Shipments increased in all industries except motor vehicles and parts. That industry showed a large decline of $1.2 billion or 8.4 pct.

There was in an increase in the value of the durable goods inventories in September—$800 million or 0.5 pct to $171.3 billion. This was the fourth increase in the last five months. U.S. manufacturers operated with the lowest level of inventories relative to sales in the past 30 years. Commerce Department chief economist Robert Ortner observed: "Manufacturers are attempting to rebuild inventories, but they're having trouble doing so because shipments are growing so fast. This suggests production will continue to grow strongly in the coming months."

Of the 30 categories shown on the accompanying table, 22 were up in September over August, six were down and two were unchanged. Compared with September 1982, 26 indicators are up this year, with only three lower and one unchanged.

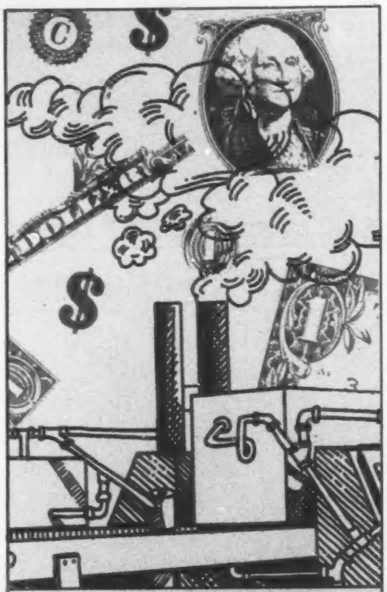
The consensus prediction of most forecasters was for growth of about 3 pct in 1983. However, the economy grew at a strong 9.7 pct in the second quarter, followed by 7.9 pct in the third quarter.

Source: U.S. Dept. of Commerce Billions of dollars, seasonally adjusted monthly total, unless otherwise noted		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
Capital Expenditures (Annual Rates)				
U.S. Industry, Total	3rd Qtr.	$313.0*	$293.4	$313.7
Manufacturing, Total	3rd Qtr.	117.4*	108.7	118.2
Manufacturing, Durable Goods	3rd Qtr.	53.0*	48.4	56.6
Mining Industry	3rd Qtr.	13.2*	10.9	14.5
Key Indicators, Durable Goods Manufacturing				
New Orders	Sept.	90.3	89.9	73.2
Shipments	Sept.	91.5	89.5	76.5
Inventories	Sept.	171.3	170.5	182.7
Unfilled Orders	Sept.	311.7	310.0	286.7
New Orders, Metalworking				
Capital Goods Producers, Nondefense Industries	Sept.	25.2	23.0	20.2
Capital Goods Producers, Defense Industries	Sept.	4.8	4.5	4.3
Primary Metals, Total	Sept.	10.9	11.0	7.9
Steel (SIC 331)	Sept.	4.8	4.7	3.3
Iron & Steel Castings (SIC 332)	Sept.	1.3	1.1	0.6
Nonferrous Metals	Sept.	4.8	5.2	4.0
Nonelectrical Mach.-Equip. Industries, Total	Sept.	17.2	15.3	13.9
Engines & Turbines	Sept.	0.8	0.9	0.9
Farm Machinery & Equipment (Shipments)	Sept.	0.9	0.8	0.9
Construction, Mining & Materials Hdlg. Equip.	Sept.	2.6	2.3	2.5
General Industrial Machinery	Sept.	1.3	1.2	1.1
Fluid Power Equipment** (Index-1972=100)	Sept.	276.0	251.0	167.0
Metalworking Machinery	Sept.	0.7	0.7	0.5
Machine Tools, Total (Millions $, unadjusted)***	Sept.	156.0	137.2	86.9
Machine Tools, Metal-Cutting***	Sept.	102.6	91.0	52.6
Machine Tools, Metal-Forming***	Sept.	53.3	46.2	34.3
Electrical Mach. & Equip. Industries, Total	Sept.	14.3	13.9	12.0
Elec. Transmission Equip. & Industrial Apparatus	Sept.	2.1	1.9	1.6
Household Appliances	Sept.	1.3	1.3	1.0
Communication Equipment	Sept.	4.3	3.9	4.5
Transportation Equip. Industrial, Total	Sept.	19.3	21.6	14.8
Motor Vehicles & Parts (Shipments)	Sept.	13.4	14.6	9.5
Aircraft, Missiles & Parts	Sept.	5.7	5.8	4.1
Shipbuilding & Military Tanks	Sept.	0.8	0.7	0.3
Fabricated Metal Products, Total	Sept.	10.8	10.3	8.6
Instruments, Total	Sept.	4.2	4.1	4.1

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

MANAGEMENT FEATURES

PLANT OUTLAYS SHIFT IS CRITICAL TO METALWORKING



The big investment bucks are flowing to high technology and service industries—at a cost to basic goods lines.

BY JOHN D. BAXTER

"Capital spending in this country isn't what it used to be. And, as time goes on, it will be less and less of what it used to be."

That's the comment made by an economist who has long studied capital investment trends in U.S. industry.

He wasn't talking about the size and importance of plant spending. He was talking about the mix, or the composition, of that investment.

The conclusion of this economist can be viewed as an outright warning to companies that produce capital equipment for basic goods industries. Their share of the capital spending pie is shrinking--and it will very likely shrink further in the future.

This finding, of course, is not a new one. For years now, a seemingly endless array of economic studies of America's ailing smokestack industries have been pointing to the same conclusion.

The findings are not new really because the investment changing-mix trend is not a new one. Most analysts say the big shift started about 15 years ago. Essentially, the swing in the outlays mix is from basic industrial goods lines to service and high technology lines.

Just one set of data quickly puts the big swing in capital outlays in clear perspective.

In the late 1960's, outlays for basic industrial capital equipment and facilities accounted for about 30 pct of total U.S. business fixed investment. By 1982, that share was down to 18 pct. In contrast, in the late 1960's, outlays for capital products of high technology industries accounted for 11 pct of total investment; in 1982, they acounted for almost 30 pct of all investment.

In sum, high technology industries, chiefly those in information technology, are not where American industry's big investment bucks are going. At the same time, investment bucks flowing to producers of capital goods for basic industries are diminishing.

The studies that show the great shift in shares of capital expenditures are based chiefly on government data. In the government's data groupings, basic industry capital equipment includes agricultural and construction machinery, mining and oilfield machinery, metalworking machinery, special industry and general industry machinery, engines and turbines, fabricated metal capital products and transportation equipment. This last category includes autos, buses, trucks, aircraft, ships and railroad equipment.

That's a big hunk of U.S. metalworking.

Many companies producing these metalworking capital goods, or, those dependent on the market strength for these goods (such as steel), are already showing signs of adapting to the great change-in-mix in capital investment. These signs are most visible in the many mergers, acquisitions, disinvestments and redeployment of corporate assets seen in basic industries in recent years.

In government data on business investment, the high technology industries are centered in the categories of office, computing and accounting machinery and communications equipment.

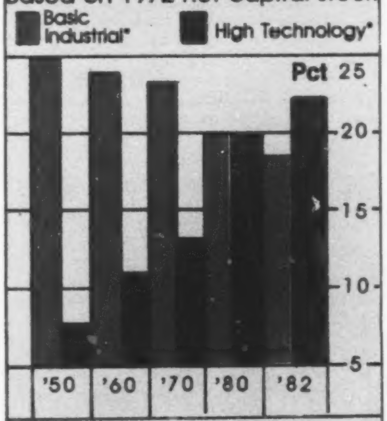
The shift in investment mix then is chiefly one from basic industries to information industries. Some analysts label the swing as one from an industrial economy to an information economy.

The swing in investment has been so great for so long that high technology industries now account for the lion's share of the capital plant and equip-

Plant and Equipment in Place

Pct of Total U.S. Industry Capital Stock

Based on 1972 net capital stock

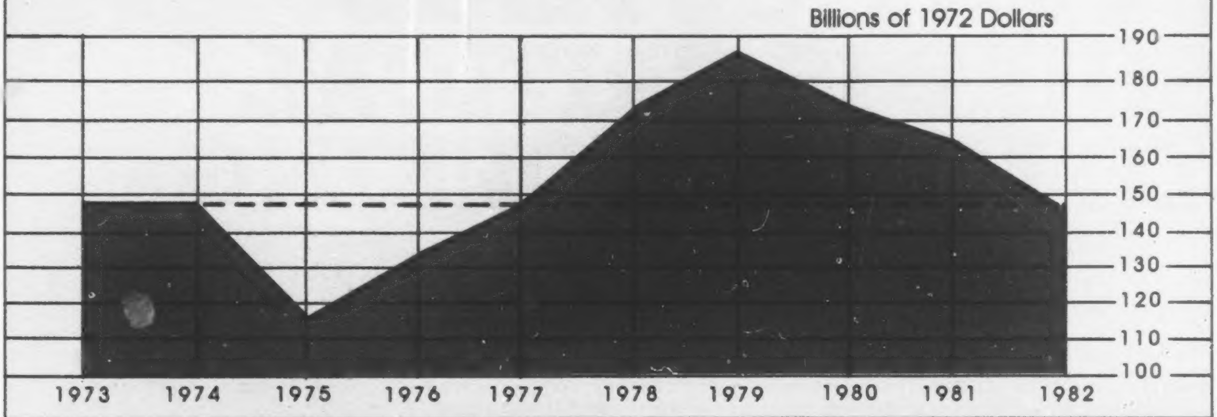


*Basic Industrial Capital Stock:
Heavy machinery & structures. Machinery includes engines & turbines, general industrial machinery (including materials handling equip.), service industry machinery, metalworking machinery, special industry machinery and construction equipment.

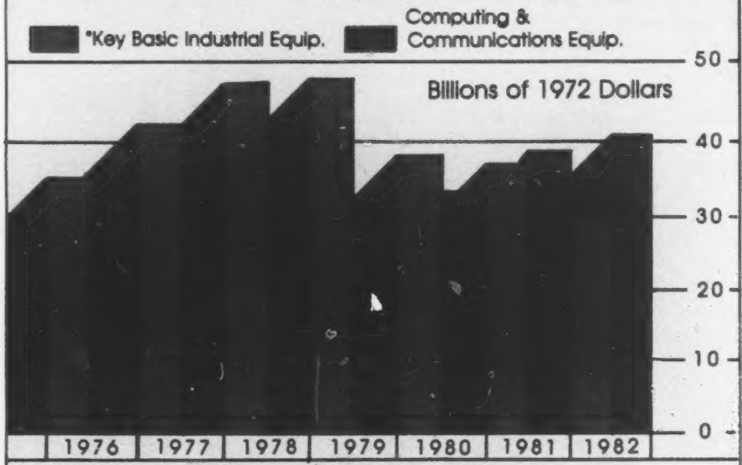
*High Technology Capital Stock:
Electrical & communications equipment, office, computing and accounting machinery, instruments and telephone & telegraph structures.

Source: Morgan Stanley & Co.

Contracts & Orders for Plant & Equipment



Business Capital Equipment Investment



*Agricultural mach. & equip., Construction equip., Metalworking Machinery, Transportation Equip. (autos, trucks, buses, aircraft, ships & RR equipment).

Plant & Equipment Investment Annual Ave. Growth Rates, Pct.

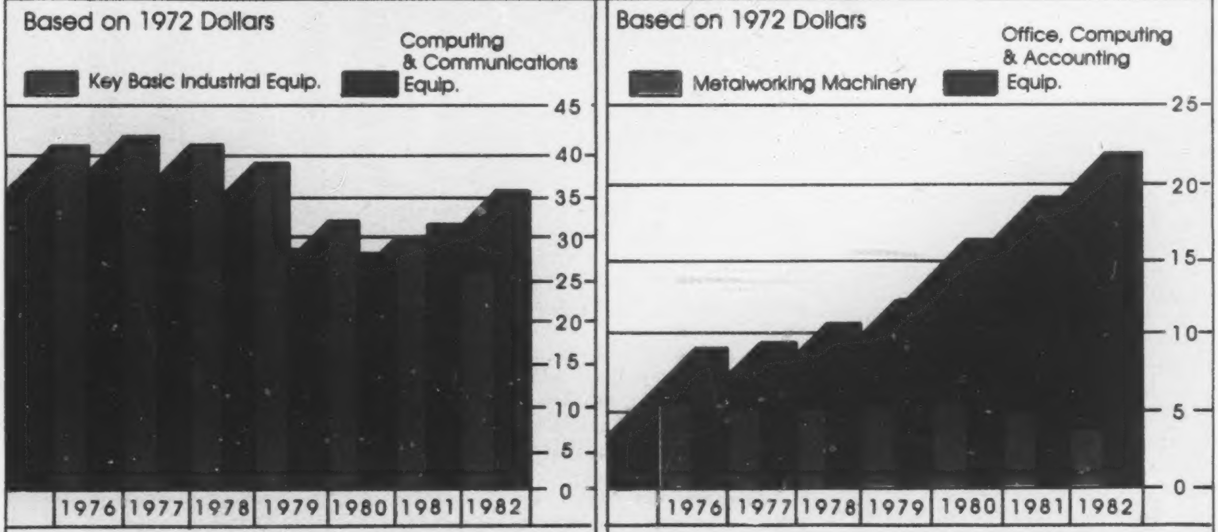
Based on 1972 Constant Dollars

	1960 to 1970	1970 to 1980
Total Business		
Fixed Investment	5.5%	3.9%
*Basic Industrial..............	5.3	1.0
Heavy Machinery	5.6	1.7
Structures..................	4.6	−1.2
High Technology	8.9	9.4
Electrical Machinery..	9.6	7.4
Computers	10.2	16.7
Instruments	7.8	7.4
Communications		
Equip......................	6.7	0.3

*See definition chart on preceding page.

Source: Morgan Stanley & Co.

Percents of Total Equipment Investment



Source: U.S. Commerce Dept.

ment in place in U.S. industry, as well as the lion's share of the spending for such goods and facilities. (See chart, p. 51).

One analyst who has studied this swing is Stephen S. Roach, senior economist with the New York investment banking firm, Morgan Stanley & Co.

"Over the past 15 years," he notes, "capital accumulation in the U.S. has undergone a dramatic transformation. Expansion of the nation's industrial base—a hallmark of the two decades after World War II—has given way to the emergence of the 'information economy' and its associated technological requirements.

"For example, in 1960, heavy machinery and industrial plant accounted for about a quarter of this country's total stock of business capital, two-and-a-half times the share of what can be called the stock of information, or high technology, capital.

"Since the mid-60s, the tide has turned. By 1980, high-tech capital achieved parity with basic industrial capacity, and, at the end of last year, it moved into a decisive lead."

Relative shifts in capital stock (the in-place pool of capital plant and equipment to most analysts) are as important as shifts in actual new investment patterns. After all, the in-place pool of capital stock is really the productive capacity of any company or industry.

Mr. Roach is one who sees real significance in the inter-industry shift in capital stock.

He terms the "changing composition of the nation's productive capacity" the most significant shift that has occurred. And this shift features, as noted, the "marked decline in the share of traditional, or smokestack, capital and the rapid growth in the technologically oriented capital base."

The bank analyst notes that in 1982, for the first time in the postwar era, "this country's stock of basic industrial capital actually declined." He sees this continuing through 1984.

When Mr. Roach talks of high technology capital, he refers to "fixed assets primarily used in the creation, manipulation or transmission of information, either in written or coded form." He includes electrical and communication equipment; office, computing and accounting machinery; instruments; and telephone and telegraph structures.

Mr. Roach's definition of basic industrial capital covers those industries noted earlier here. He condenses his definition by saying it is "the heavy machinery and industrial buildings used directly in goods production."

Too, his measure of capital stock is in 'net' terms. He has allowed for depreciation. That is an important distinction in measuring capital stock and capital investment because, as he notes, "...only a small portion of such investment is earmarked for the actual expansion of productive capacity. A very large share—currently around 75 pct—must go to replace aging or worn-out facilities."

The growth of capital stock in high-tech industries seems destined to continue in the years ahead—at a cost to capital stock of basic industries. This is because plant and equipment investment in high-tech industries has lately been accelerating while the investment by basic industries has been flagging.

"The speed of that transformation," says Mr. Roach, "has been especially rapid in recent years."

Analysts at Chicago's Continental Bank confirm this point. They note, "Investment in computers and communication equipment in the early quarters of this recovery accounted for about two-thirds of the total increase in equipment purchases."

In contrast, the Continental Bank analysts point out that investment in heavy industrial and construction equipment fell to levels not seen since the 1960's."

In light of this acceleration-deceleration scenario, it is not suprising that, for example, worldwide shipments of computers from U.S. suppliers are forecast to go up from $34.4 billion last year to $76.6 billion by 1987. That would be about $10 billion more than forecast capital spending by the entire U.S. durable goods manufacturing sector in that latter year.

This forecast on computers, a capital goods item, was made recently by International Data Corp., a leading international business research firm.

Computers, it is said, are to high technology industries what machine tools are to basic goods industries. Notably, while computer shipments have been soaring, investment in machine tools has lagged. In the years 1960 through 1970, machine tool consumption in this country as a percentage of total capital equipment consumption averaged 18.8 pct. In the years 1971 through 1981, machine tool consumption was down to a 14.5 pct average. That trend appears to be continuing.

Ironically, much of the thrust in high-tech capital goods gains has come from investments by manufacturing industries—of which, of course, manufacturers of basic goods make up a big share. The National Assn. of Manufacturers has noted that in 1982, half of the capital spending by U.S. manufacturing industries went for high technology capital goods including computers, instruments and electronic and communications systems.

Another big thrust for high-tech equipment has come lately from service industries. One report notes that this sector's spending on high-tech goods accounts for about 30 pct of all U.S. business capital investment. This share was only 16 pct as late as 1975.

Mr. Roach has found in his studies that capital investment per worker in service industries is growing much faster than in manufacturing.

A recent U.S. Labor Dept. study ranking 145 U.S. industries found that the majority of service industries were actually among the 20 pct of industries that were most capital intensive. Some see an irony in this trend. Deindustrialization seems to be occurring in the manufacturing sector, while industrialization seems to be coming to the service sector in this country.

The service industries are far-flung. They range from public utilities to law firms and from transportation services to retail stores. These industries now outweigh goods-producing industries in this country. This is made clear by just one measure—employment. Services now employ 74 pct of all U.S. workers.

The charts with this article depict clearly the shifting pattern in U.S. business capital investment. The shift away from basic manufacturing capital goods has hit these industries especially hard because of lack of overall growth thrust in in capital investment in this country in recent years. For basic goods industries, the story over these years has been that of a smaller slice of a pie that itself seems to get smaller.

One chart—contracts and orders for plant and equipment—pictures a great deal of cyclical bounce in investment over the past 10 years. However, in 1982, the dollar volume in real terms was right where it was 10 years ago.

Presidential economic adviser Martin Feldstein has termed U.S. overall investment in plant and equipment over the past two decades as, "pathetically low." He is talking in terms of net inflation-adjusted plant and equipment investment only. This means he is looking at investment figures after allowing for depreciation and disregarding inventory and residential investment. On these terms, he has found that only a tiny 3 pct of GNP has gone for net plant and equipment investment over the two-decade period.

Mr. Feldstein's figures contrast sharply with often-published data that shows gross capital spending in relation to GNP running at high numbers. By this economist's calculations, however, plant spending in this country has been running at very low levels in both historical terms and in comparison with investment by other industrial nations.

The picture of the swing in investment shares is summed up in the chart that compares average annual growth rates in investment in various product lines over the two periods, 1960 to 1970 and 1970 to 1980.

In this chart it is seen that total business investment fell from a 5.5 pct annual growth rate in the earlier period to a 3.9 pct rate in the latter period. The real slide came in investment in basic industrial goods lines; the decline here was from 5.3 pct to 1.0 pct growth.

But, notably, in the same chart, it is seen that investment in high-tech capital goods—despite the overall capital investment growth rate decline—showed a faster growth rate in the latter period compared to the previous one.

There are many implications that come from the great shift taking place in business capital investment in this country.

Certainly, there is a worker retraining implication as basic goods manufacturers meet the investment shift with necessary worker layoffs. Too, there is an impact on national productivity. High-tech and service industries generally have lower productivity than does manufacturing. Thus, the swing away from manufacturing implies lower national productivity levels.

Too, very importantly, the world trade strength of various U.S. industries is affected as investment patterns change. With less new plant and equipment coming onstream in basic industries, these industries are increasingly less able to meet and beat world competition.

In a Brookings Institution study made by Robert Lawrence, he found that the U.S. trade surplus in the products of high-tech industries grew from $12 billion in 1972 to $40 billion in 1979. Over the same time span, the trade deficit in other manufactured products rose from $15 billion to $35 billion.

Still, to executives in basic goods producing companies, the meaningful implications to shifting investment patterns are those that center on their own corporate growth and success.

Some companies are already moving into what one metalworking industry top executive calls, "better corporate balance for the years ahead."

Some other company managers are turning to "strategic shrinkage." This usually involves a downsizing of productive capacity.

Other managers are planning to "stay where we are." One executive of this latter persuasion notes that "a good way to get chewed up is to move into big-growth lines. That's where the tigers congregate. We will stay in our line, toughen ourselves, and I think become big eventual winners..."

There is a seeming growing awareness among managers in basic goods lines that the investment swing is a secular, or long-term one, not just a cyclical one. The last two recessions of 1980-82 hit basic goods with a special fury, it is true, but signs of a structural shift were clear long before 1980.

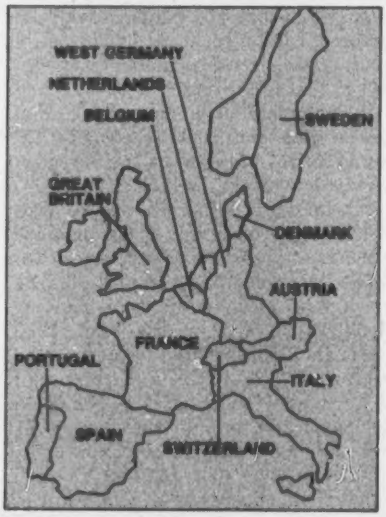
Whatever course corporate managers in basic goods industries take to cope with the investment shift, that action should have better chances of success if it based on as much information as they can get on how that shift is affecting their own companies.☐

Reprints available while supply lasts. For single copy, circle No. 80 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4428.

BEST SOURCE. BEST BUY.
EUROPE

Real Value is Profitability

The only machine tools you can afford today are those with real value. Something better in technology. Something special in quality. Something extra in service.
Real value means getting more in every measurable operating factor. In other words, real profit.
Our 1500 machine tool builders in Western Europe build machines that perform. Machines with real value from start to finish.
Many of our sophisticated, special machines employ one-of-a-kind advanced technology.



New, FREE Brochure

Our standards offer unique designs, long-life construction, or extraordinary features.

Whether you need a complete flexible manufacturing system or just a single machine, look to Europe first. We're the real value people who care.

Write, or circle the reader card for a free copy of Machine Specs Europe. A new way to evaluate hundreds of European machine tools with a single request.

cecimo
Write: Mr. Lucien Rama, Secretary-General
rue des Drapiers 21
B-1050 Brussels, Belgium

CECIMO Member Nations: Austria • Belgium • Denmark • France • West Germany • Great Britain • Italy • Netherlands • Portugal • Spain • Sweden • Switzerland

For Information, Circle 148

EFFECTIVE NOVEMBER 14, 1983

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	182	179	182	160
Buffalo	9	9	9	31
Pittsburgh	236	233	229	137
Youngstown	81	112	112	56
Cleveland	139	142	143	65
Detroit	131	138	132	98
Chicago	506	497	487	322
Cincinnati	85	76	94	64
St. Louis	74	75	80	54
Southern	155	139	142	70
Western	74	73	88	49
U.S. Production	1,672	1,673	1,698	1,106

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton $32.78
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

Steel Production, Composite Prices

(Effective November 14, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,672	1,673	71,691	64,136
Capability Utilization Rate	57.9	58.0	55.0	48.1

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 80.50	$ 79.17	$ 77.83	$ 51.17
No. 2 bundles	$ 48.17	$ 47.50	$ 46.50	$ 38.83
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 84.50	$ 84.50	$ 82.50	$ 52.50
No. 1 steel, Philadelphia	77.50	73.50	71.50	54.50
No. 1 steel, Chicago	79.50	79.50	79.50	46.50
No. 1 bundles, Detroit	81.50	81.50	81.50	41.50
Low Phos., Youngstown	84.50	84.50	84.50	52.50
No. 1 mach'y cast., Pgh	74.50	74.50	74.50	64.50
No. 1 mach'y cast., Phila	95.50	95.50	95.50	98.50
No. 1 mach'y cast., Chi	109.50	109.50	109.50	103.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

***Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective November 14, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	65.00-66.00	65.00-68.00	11/4/83
Lead	25.00-27.00	26.00-27.00	10/27/83
Magnesium ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	49.00	46.00-49.00	10/25/83

ALUMINUM: 99.5%. COPPER (C) — cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.80-$1.90
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$382.60
Indium, dollars per troy oz.	$3.20
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$340-$350
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.895
Vanadium	$4.94
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 7—580.80
Nov. 8—Holiday
Nov. 9—581.27
Nov. 10—583.75
Nov. 11—Holiday

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	63⅛	61
Yellow brass	58	55
Red brass	60⅜	56
Comm. bronze	61	56¾
Mang. bronze	59⅝	57¾
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	59
No. 2 copper wire	49
Light copper	40

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	45
Light copper	36
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	28
Radiators	42

Aluminum

New mixed clips	47	—48
Old sheet	45	—46
Old cast	45	—46
Clean dry borings	45	—46

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	40	—41
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	51	—52
No. 2 copper wire	43	—44
Light copper	39	—40
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	27	—28
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	10	—11

EFFECTIVE NOVEMBER 14, 1983

MATERIALS NEWSFRONT

(Effective November 14, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 84.00 to	$ 85.00
No. 2 hvy. melting	74.00 to	75.00
No. 1 dealer bundles	105.00 to	106.00
No. 1 factory bundles (auto)	106.00 to	107.00
No. 2 bundles	51.00 to	52.00
No. 1 busheling	99.00 to	100.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	46.00 to	47.00
Cast iron borings	45.00 to	46.00
Low phos. punchings plate	104.00 to	105.00
Heavy turnings	74.00 to	75.00
No. 1 RR hvy. melting	101.00 to	102.00
Rails 2 ft. and under	106.00 to	107.00
Scrap rails, random lgth.	89.00 to	90.00
RR specialties	104.00 to	105.00
No. 1 machinery cast	74.00 to	75.00
Cupola cast	67.00 to	68.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	600.00 to	610.00
18-8 turnings	500.00 to	510.00

Chicago

No. 1 hvy. melting	$ 79.00 to	$ 80.00
No. 2 hvy. melting	72.00 to	73.00
No. 1 dealer bundles	105.00 to	106.00
No. 1 factory bundles (auto)	105.00 to	106.00
No. 2 dealer bundles	44.00 to	45.00
No. 1 busheling	100.00 to	101.00
Shredder scrap	87.00 to	88.00
Machine shop turn.	32.00 to	33.00
Mixed bor. and turn.	33.00 to	34.00
Shoveling turnings	38.00 to	39.00
Cast iron borings	51.00 to	52.00
Low phos. forge crop	101.00 to	102.00
Low phos. punchings plate ¼ in. and heavier	111.00 to	112.00
Low phos. 2 ft. and under	109.00 to	110.00
No. 1 RR hvy. melting	96.00 to	97.00
Scrap rails, random lgth.	89.00 to	90.00
Reroller rails	104.00 to	105.00
Rails, 2 ft. and under	108.00 to	109.00
RR couplers and knuckles	94.00 to	95.00
RR car axles	119.00 to	120.00
No. 1 machinery cast	109.00 to	110.00
Cupola cast	97.00 to	98.00
Stove plate	97.00 to	98.00
Steel car wheels	102.00 to	103.00
Stainless		
18-8 bundles and solids	560.00 to	570.00
18-8 turnings	460.00 to	470.00
430 bundles and solids	135.00 to	140.00
430 turnings	100.00 to	105.00

Philadelphia

No. 1 hvy. melting	$ 76.00 to	$ 79.00
No. 2 hvy. melting	65.00 to	68.00
No. 1 dealer bundles	92.00 to	95.00
No. 2 dealer bundles	47.00 to	50.00
No. 1 busheling	92.00 to	95.00
Shredder scrap	87.00 to	90.00
Machine shop turn.	23.00 to	26.00
Mixed bor. and turn.	23.00 to	26.00
Shoveling turnings	42.00 to	45.00
Low phos. 5 ft. and under	90.00 to	93.00
Low phos. 2 ft. punchings	101.00 to	104.00
Electric furnace bundles	100.00 to	103.00
RR specialties	90.00 to	93.00
Rails, 2 ft. and under	103.00 to	106.00
Cupola cast	65.00 to	68.00
Heavy breakable cast	53.00 to	56.00
No. 1 machinery cast	94.00 to	97.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00 to	$ 60.00
No. 2 hvy. melting	57.00 to	58.00
No. 1 dealer bundles	61.00 to	62.00
No. 2 bundles	40.00 to	41.00
No. 1 busheling	60.00 to	61.00
Drop forge flashings	55.00 to	56.00
Machine shop turn.	31.00 to	32.00
Mixed borings and turn.	20.00 to	21.00
Shoveling turnings	31.00 to	32.00
Cast iron borings	34.00 to	35.00
Heavy breakable cast	35.00 to	36.00
Mixed cupola cast	51.00 to	52.00
Automobile cast	74.00 to	75.00
Stainless		
18-8 bundles and solids	470.00 to	480.00
18-8 turnings	350.00 to	360.00
430 bundles and solids	115.00 to	125.00

Youngstown

No. 1 hvy. melting	$ 73.00 to	$ 76.00
No. 2 hvy. melting	51.00 to	54.00
No. 1 dealer bundles	87.00 to	90.00
No. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	13.00 to	15.00
Shoveling turnings	17.00 to	20.00
Low phos. plate	83.00 to	86.00
Electric furnace bundles	78.00 to	81.00
Galvanized bundles	72.00 to	75.00

Cleveland

No. 1 hvy. melting	$ 69.00 to	$ 72.00
No. 2 hvy. melting	34.00 to	37.00
No. 1 dealer bundles	87.00 to	90.00
No. 1 factory bundles	97.00 to	100.00
No. 2 bundles	23.00 to	27.00
No. 1 busheling	86.00 to	89.00
Machine shop turn.	11.00 to	14.00
Mixed bor. and turn.	11.00 to	14.00
Shoveling turnings	13.00 to	16.00
Cast iron borings	16.00 to	19.00
Cut structural & plates, 2 ft. and under	102.00 to	105.00
Low phos. punchings plate	102.00 to	105.00
Drop forge flashings	42.00 to	45.00
Foundry steel, 2 ft. & under	59.00 to	62.00
No. 1 RR hvy melting	77.00 to	80.00
Rails, 2 ft. and under	105.00 to	108.00
Rails, 18 in. and under	106.00 to	109.00
Steel axle turnings	67.00 to	70.00
Railroad cast	80.00 to	83.00
No. 1 machinery cast	97.00 to	90.00
Cupola cast	60.00 to	63.00
Stove plate	45.00 to	48.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 63.00 to	$ 64.00
No. 2 hvy. melting	51.00 to	53.00
No. 1 busheling	74.00 to	75.00
No. 1 dealer bundles	74.00 to	75.00
No. 2 bundles	35.00 to	36.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	12.00 to	13.00
Low phos. plate	74.00 to	75.00
Structural and plate, 2 ft. and under	74.00 to	75.00
Rails, 2 ft. and under	84.00 to	85.00
Scrap rails, random lgth.	69.00 to	70.00
No. 1 machinery cast	75.00 to	76.00
No. 1 cupola cast	54.00 to	55.00

St. Louis

No. 1 hvy. melting	$ 72.00 to	$ 73.00
No. 2 hvy. melting	61.00 to	62.00
Foundry steel, 2 ft.	61.00 to	62.00
No. 1 dealer bundles	72.00 to	73.00
No. 2 bundles	58.00 to	59.00
Machine shop turn.	20.00 to	21.00
Shoveling turnings	27.00 to	28.00
Cast iron borings	38.00 to	39.00
No. 1 RR hvy. melting	81.00 to	82.00
Rails, random length	78.00 to	79.00
Rails, 18 in. and under	94.00 to	95.00
RR specialties	87.00 to	88.00
Cupola cast	70.00 to	71.00
Heavy breakable cast	48.00 to	49.00
Stove plate	75.00 to	76.00
Cast iron car wheels	49.00 to	50.00
Rerolling rails	99.00 to	100.00
Unstripped motor blocks	57.00 to	58.00

Birmingham

No. 1 heavy melting	$ 70.00 to	$ 71.00
No. 2 heavy melting	66.00 to	67.00
No. 1 dealer bundles	72.00 to	73.00
No. 2 bundles	52.00 to	53.00
No. 1 busheling	72.00 to	73.00
Shredder scrap	94.00 to	95.00
Machine shop. turn.	24.00 to	25.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	33.00 to	34.00
Electric furnace bundles	67.00 to	68.00
Elec. furnace, 3 ft. & under	75.00 to	76.00
Structural and plate, 2 ft.	97.00 to	98.00
Structural and plate, 4 ft.	92.00 to	93.00
No. 1 RR hvy. melting	92.00 to	93.00
Scrap rails, random lgth.	86.00 to	87.00
Rails, 18 in. and under	100.00 to	101.00
Angles and splice bars	94.00 to	95.00
No. 1 cupola cast	87.00 to	88.00
Unstripped motor blocks	64.00 to	65.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	58.00 to	59.00
No. 1 dealer bundles	74.00 to	75.00
No. 2 bundles	32.00 to	33.00
Machine shop turn.	10.00 to	11.00
Shoveling turnings	12.00 to	13.00
Cast iron borings	17.00 to	18.00
Low phos. 18 in. and under	92.00 to	93.00
Rails, random length	73.00 to	74.00
Rails, 2 ft. and under	91.00 to	92.00
No. 1 cupola cast	70.00 to	71.00
Heavy breakable cast	36.00 to	37.00
Drop broken cast	82.00 to	83.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 40.00 to	$ 45.00
No. 2 hvy. melting	37.00 to	40.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	45.00 to	46.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	70.00 to	80.00
410 solids	60.00 to	70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	40.00 to	42.00
No. 1 dealer bundles	68.00 to	70.00
No. 2 bundles	33.00 to	35.00
No. 1 busheling	68.00 to	70.00
Shredder scrap	68.00 to	70.00
Machine shop turn.	8.00 to	10.00
Shoveling turnings	13.00 to	15.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	40.00 to	42.00
Heavy breakable cast	10.00 to	12.00

San Francisco

No. 1 hvy. melting	$ 44.00 to	$ 46.00
No. 2 hvy. melting	36.00 to	38.00
No. 1 dealer bundles	29.00 to	31.00
No. 2 dealer bundles	13.00 to	15.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	73.00 to	75.00

Los Angeles

No. 1 hvy. melting	$ 40.00 to	$ 42.00
No. 2 hvy. melting	29.00 to	31.00
No. 1 dealer bundles	27.00 to	29.00
No. 2 dealer bundles	10.00 to	12.00
Machine shop turn.	6.00 to	8.00
Shoveling turnings	10.00 to	12.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	73.00 to	75.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 61.00 to	$ 63.00
No. 2 hvy. melting	50.00 to	52.00
No. 2 bundles	40.00 to	42.00
No. 1 cupola cast	96.00 to	98.00
Mixed yard cast	83.00 to	85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 65.00
No. 2 heavy melting cut 2 ft. and under	62.00
No. 1 dealer bundles	70.00
No. 2 bundles	38.00
Mixed steel scrap	44.00
Bush. new fact. prep'd.	68.00
Bush. new fact. unprp'd.	60.00
Machine shop turn.	33.00
Short steel turn.	36.00
Mixed bor. and turn.	23.00
Cast scrap	58.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 79.00 to	$ 80.00
No. 2 hvy. melting	63.00 to	65.00
No. 2 bundles	41.00 to	43.00
Machine shop turn.	22.00 to	23.00
Crushed turnings	46.00 to	48.00
Shredder scrap	79.00 to	80.00
Cut structural plate 2 ft. and under	94.00 to	96.00
Unstripped motor blocks	57.00 to	59.00
Cupola cast	78.00 to	80.00

DECEMBER 5, 1983

IRON AGE

THE MAGAZINE FOR METAL PRODUCING MANAGEMENT

12/4/83
C2150-2

CK014CONGRES---0C
0 JUN99 SCF
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

World Steel in Figures
1983
IISI 17
VIENNA AUSTRIA 2-5 OCT
7X-15X35

INSIDE J&L'S REVAMPED CAMPBELL WORKS

TWO COMPANIES GO BACK TO BASICS IN MAKING STAINLESS

REPORT FROM VIENNA

A LOOK AT STEEL IN 1990

VOL. 226, NO. 29

IRON AGE

DECEMBER 5, 1983

COVER STORY

MP-7 VIENNA REPORT: STEEL IN 1990
Don't count on less trade friction. Look for more slab exports and expansion from Third World, say leaders at IISI meeting.

FEATURES

28 GM AT 75: THE MAKING OF A GIANT
Quality, cost and schedule are key demands on its operations.

53 HUNTINGTON EMPLOYS A WORK CENTER PROGRAM
It removes impediments and "lets the man work."

61 HOW COMPANIES ARE PUTTING WASTE OIL TO WORK
The U.S. trails Japan and West Germany in recycling lubricants.

68 NEW APPLICATIONS FOR HIGH-PERFORMANCE STAINLESS
Scrubbers, sour gas wells and heat exchangers are naturals.

75 EDM/ECM: THE EXOTIC BECOMES THE ROUTINE
Both appeared in the 1970s and have been refined significantly.

MP-16 INSIDE J&L'S REVAMPED CAMPBELL WORKS
The company has tuned up that facility with $60 million.

MP-19 GETTING BACK TO BASICS IN STAINLESS STEELMAKING
Allegheny Ludlum and Kawasaki are doing it.

NEWSFRONTS

7 EDITORIAL
Frank Perdue is good enough for me

13 METALWORKING NEWSFRONT
Canada is accused of unfairly aiding its tooling industry.

51 YOU AND YOUR JOB
Today's PR executives must be multifaceted sophisticates.

58 TECHFRONT
Speedy silicon nitride cutting tools cop "I-R" award.

83 PRODUCTS NEWSFRONT
Synthetic rubber inserts increase coil payoff reel capacity.

85 MATERIALS NEWSFRONT
Fourth quarter steel shipments could top 19 million tons.

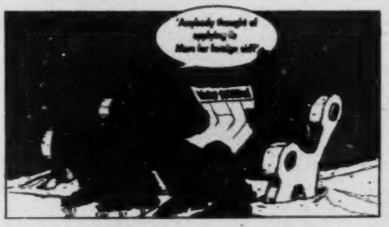
100 METALWORKING PRICE TRENDS
Producer prices posted a moderate 0.3 pct gain in October.

MP-3 METALPRODUCING NEWSFRONT
Foreign policy was one reason for the ban on nickel imports.

DEPARTMENTS

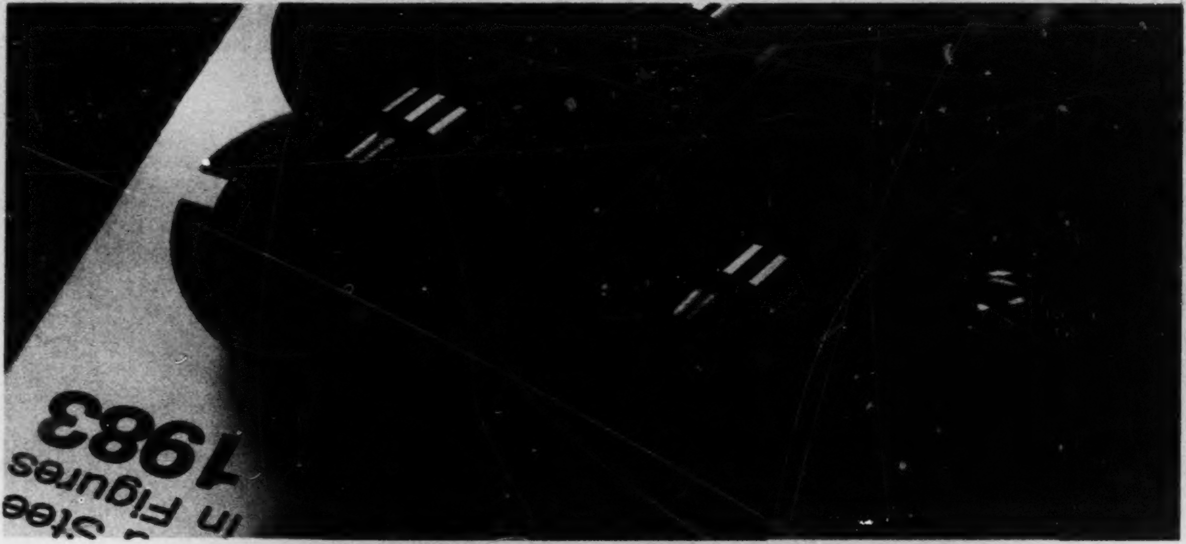
8 EDITORIAL STAFF
24 INDUSTRIAL BRIEFS
89 P&P DATA 11/28
90 BUSINESS STAFF
90 AD INDEX
91 MANAGEMENT SERVICE CARD
93 FERROUS SCRAP 11/28
96 STEEL PRICES
98 CLEARING HOUSE

NEXT ISSUE



Third annual Scrapbook of American Business Humor

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089, appearing on the first Monday and third Friday each month. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077



VIENNA REPORT: STEEL IN 1990

Don't count on less trade friction. Look for more slab exports and expansion from Third World, say world steel leaders at IISI meeting.

BY GENE BEAUDET

What will the world steel industry be like in the 1990's?

Given the chaotic conditions in the world steel market, forecasting even the short-term future can be a risky business.

But some glimpses of the future, and the hopes and fears that go along with it, were voiced in abundance at the seventeenth annual meeting of the International Iron & Steel Institute in Vienna in early October.

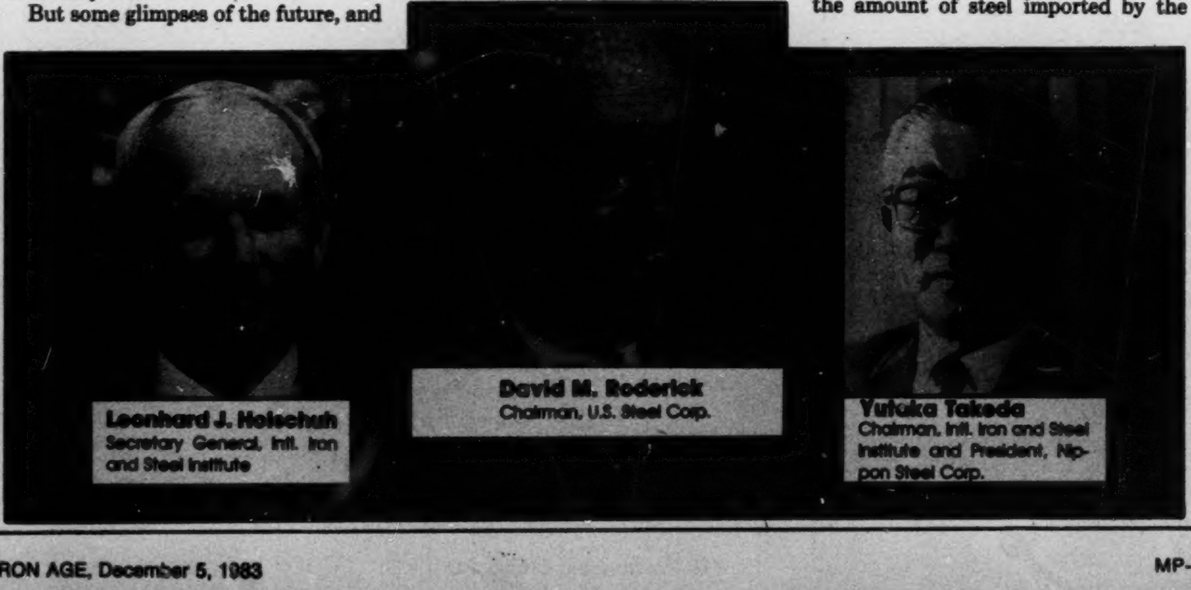
For example:

Will there be more trade friction among steel producing nations in the years ahead?

Yes, indeed.

Yes, indeed, as industrialized nations try to hold on to their domestic markets and their traditional markets overseas. And yes indeed as developing nations try to find outlets for steel that they can't absorb at home.

In September, for example, Third World imports accounted for 42 pct of the amount of steel imported by the



Leonhard J. Holschuh
Secretary General, Intl. Iron and Steel Institute

David M. Roderick
Chairman, U.S. Steel Corp.

Yutaka Takeda
Chairman, Intl. Iron and Steel Institute and President, Nippon Steel Corp.

What the Future Holds

The data opposite was prepared by the General Secretariat of the IISI and included in the Secretary General's report to the membership.

Mr. Holschuh is quick to point out that these are not steel industry figures, but rather the views of the Secretariat. Still, the figures are worth more than a passing glance.

Note that the United States is expected to increase its apparent steel consumption next year by 12.2 pct over 1983. Since the U.S. is the largest steel consumer in the free world, it's no wonder many more non-Americans at the meeting remarked, "We are all waiting for the U.S. economy to revive."

The longer view, though, is something else again.

Though by 1990, apparent steel consumption by North America, the European community and Japan is expected to trail off a bit. For all industrialized countries consumption will take a good-sized drop of 5 pct from 365 million metric tons to 346 million. How will this be made up? With lighter weight steels, non-metallic materials or imports?

But look at the steel consumption growth in developing countries! It will jump from 98 million to 137 million metric tons in just ten years.

This could help relieve the pressure from increased Third World capacity.

The most revealing of all the tables, though, is the one estimating the amount of liquid steelmaking capacity in the Western-aligned countries from 1974 to 1980.

Both Western Europe and North America are headed for big declines. Some of this is taking place now, but obviously there will be more to come.

As for Japan, only a slight capacity decline is expected from 1980 to 1990. But in an informal interview at the IISI meeting, Mr. Takeda, president of Nippon Steel, suggested that the drops in his country's capacity could be more than that.

But the big shocker in this table is the quadrupling of developing countries' growth from 1974 to 1990, and, even more significant, the more than doubling of growth in capacity from 1980 to 1990.

This should keep Western steel producers looking over their shoulders and to their government for assistance for the next six years.

Apparent Steel Consumption

	million metric tons		Pct Change
	1983E	1984	1984/83
EEC	89	93	+ 4.5
Other Western Europe	31	31	—
USA	98	110	+12.2
Japan	66	67	+ 1.5
Other industrial countries	21	25	+19.0
Total	306	326	+ 6.9

	million metric tons		Pct Change
	1983E	1984	1984/83
Western World industrial countries	305	326	+ 6.9
Developing countries	89	92	+ 3.4
Total	394	418	+ 6.1
COMECON	206	206	—
China and North Korea	53	53	—
World Total	653	677	+ 3.7

	million metric tons		
	1980	1985	1990
North America	132	130	127
EEC	108	100	96
Japan	79	73	73
Other industrial countries	46	47	50
Total industrial countries	365	350	346

	million metric tons		
	1980	1985	1990
Industrial countries	365	350	346
Developing countries	98	112	137
Total Western World	463	462	483
COMECON, China and North Korea	256	263	275
Total World	719	725	758

	million metric tons		Pct growth rate
	1985	1990	per annum
Industrial countries	350	346	− 0.2
Developing countries	112	137	+ 4.1
Total Western World	462	483	+ 0.9
COMECON, China and North Korea	263	275	+ 1.0
Total World	725	758	+ 0.9

Western World Liquid Steelmaking Capacity

	million metric tons		
	1974	1980	1990
Western Europe	203	223	175/192
North America	156	152	128/146
Japan	126	142	140
Developing countries	33	60	112
Others	15	18	20
Total	533	595	575/610

Source: IISI

U.S.—just about the combined shipments of Japan and Europe into the U.S. market.

This prompted a quick reaction from American producers to petition the U.S. government to limit this new flood of steel imports.

But will these kinds of actions here and in other industrialized nations be enough, or even work in the longer term?

Even though the U.S. quotas on carbon steels and tariffs in specialty steels from Europe are in place; and even though Yutaka Takeda, incoming chairman of the IISI and president of Nippon Steel Co., said at the meeting that his country will "maintain the practice of voluntarily limiting steel shipments to the U.S. and elsewhere," circumstances can and do change.

At the base of the problem is the world overcapacity in steel, the need to keep workers employed and the need to get U.S. dollars.

This turmoil in world steel trade prompted Leonard J. Holschuh, secretary general of the IISI, to say in his annual report to the members:

"A new consensus in the organization of international trade should be sought, as there is hardly any possibility of altering the economic and social systems, which, in international trade lead to tensions. . ."

Trade friction was not the only question seeking answers at the IISI meeting, though.

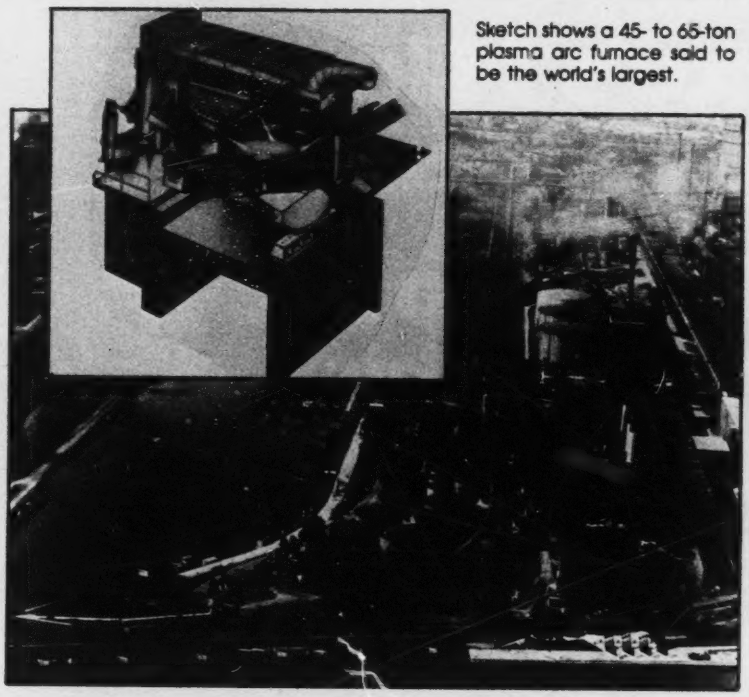
Will there be more steel mergers, acquisitions, and capacity reductions in the years ahead?

The answer to this one is easy. Yes.

Big cutbacks have been made in the United States, Great Britain, France and Germany through the merger route or downright shutdowns. Japan is forecast to cut back less. As for Third World nations, all systems still seem to be on go, or at least on hold.

General support for the scenario was given by David R. Roderick, chairman of United States Steel Corp., who said that he expects more consolidations and divestitures among U.S. and major

Yesterday, Today and Tomorrow



Sketch shows a 45- to 65-ton plasma arc furnace said to be the world's largest.

Needless to say, any IISI conference in Vienna would not be complete without a visit to the nearby Linz plant of Voest-Alpine, AG.

For, at this plant site, one can see or learn about important steel developments of the past, the present and the future.

It was here that the first large scale LD steel plant was put into operation in 1952. At the time, its 30-ton capacity was not considered by many as sufficient to warrant wide scale applications.

Since then, though, the LD oxygen process has grown in size and technological advancements. Today, about 50 pct of the world's steel production is produced by the LD process. The plant has been idle since 1972 and has been made into a permanent exhibit.

Standing next to it on the converter charging platform, though, is Voest-Alpine's most recent technical advance—a 45- to 65-ton per hour plasma furnace capable of producing a variety of steel grades.

The furnace was scheduled for production in late October and is claimed to be the largest of its kind in the world.

It is said to offer an alternative to induction and electric arc furnaces for the production of unalloyed, alloyed and special alloy steels. Among the advantages cited for the plasma furnace are no electrodes, high yields and low noise levels.

But, what does Voest-Alpine have coming up?

Well, one development is a new rolling mill plant concept that is said to bridge the gap between the semi-continuous hot strip mill and the Steckel mill.

The new approach is the hot strip reversing concept (HSRC) mill. It is modular and can serve as the final processing plant in a mini-mill or can compete with semi-continuous hot strip mills.

The rolling technique used is based on the principle of alternating single or tandem rolling. Initial passes are rolled on stand No. 1, while stand No. 2 remains open. Tandem operation is applied for the intermediate passes on stands No. 1 and 2. Rolling of the finishing passes is on stand No. 2 while stand No. 1 is open. During finishing passes, the material to be rolled is stored on coilers with heated mandrels.

Besides the compact arrangement of roughing and finishing stand, a number of other technical features are included in the HSRC mill concept: Crop shear, induction strip heating, roller table insulation and tensiometer roller.

Due to the compact stand arrangement, there are three important advantages of the HSRC mill compared with the Steckel mill:

—The reduction of length of the entire mill is about 30 pct, which means lower investment costs;

—there is an increase in rolling capcity as a result of tandem passes and higher rolling speeds, and

—a higher temperature is maintained during rolling due to tandem operation and higher rolling speeds.

world steel producers in the future.

And, in his remarks to the IISI members, Chairman Takeda said, "... the rationalization of steel industries and the strengthening of their financial positions have become tasks of national importance in all Western countries. Steel producers in the Western World are now looking frantically to revitalize their industries and Japan is no exception."

The third big question at the IISI meeting was:

"Will steel producers in underdeveloped nations be shipping more semi-finished steel for finishing by steelmakers in developed countries."

There was little argument about this one. American producers have already purchased some slabs from abroad. And Mr. Roderick says his company is continuing its efforts to buy some 3 million tons of steel yearly from the British Steel corp.

And at the meeting, itself, semi-finished producers were actively looking for buyers of their products. In addition to BSC, South Africa's Iscor and Brazilian firms were trying to line up orders on the spot.

Those in favor of slab imports talked about the energy savings they would gain and the greater profits they would make on adding greater value to a lower grade product.

But there were those who warned that a country could only go so far in dropping semi-finished lines and plants. In times of a ntional emergency the basic producing units must be there to support production of finished goods.

All in all though, the world steel industry as seen from Vienna could not be in worse shape. But IISI Chairman Takeda hit the proper note when he said, "This, however, should not lead us to think ... that steel is a declining industry. We must not forget that steel is an important basic industry without which countless other industries could not survive." ☐

Reprints available while supply lasts. For single copy, circle No. 82 on Inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4430.

TECHNOLOGY FEATURES

HOW COMPANIES ARE PUTTING WASTE OIL BACK TO WORK

While Japan recycles 70 pct of its lubricants, and West Germany does even better, the U.S. lags far behind with 18 pct back in use.

BY KEITH W. BENNETT

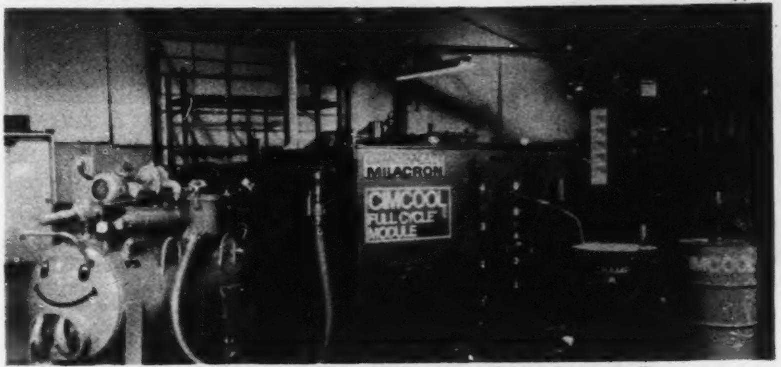
You'd never know there'd been an oil shortage. Americans use two billion gallons a year of lubricating oils and grease. Only 100 million gallons of this is recovered by recycling and re-refining. By contrast Japan recycles 70 pct of its lubricants. West Germany, supposedly, does an even better job of putting its "waste" oil back to work.

Before the oil crisis, and the subsequent oil glut, we did a bigger job. James McBain, executive director of the Association of Petroleum Re-refiners, (APR) recalls there were 150 companies recyling 300 million gallons of lubricants per year back in the 1960's—18 pct of all lubricants in use.

Now, the bulk of re-refining is done by only 13 companies, though the APR has 80 member companies, from large to small. "It appears that a recovery may have begun about two years ago," Mr. McBain says, noting eight or more new recyling plants have been set up since that period.

A full-scale oil re-refining plant can cost from $5 million to $20 million, industry sources say. And since the re-refining and recycling industry has been pinned between low virgin oil prices,

(Cont. on p. 64)



Cincinnati Milacron's batch processor cleans cutting fluids of tramp oil.

WASTE OIL COLLECTED, 1978

	Sales of New Oil 1978 (1,000 gallons)	Estimated Collection	
		Percentage (Estimated)	Volume (1,000 gallons)
Automotive lubricants (retail sales)	642,280	22.8	146,400
Truck & fleet (commercial sales)	448,440	55.0	246,600
Transmission Fluid	217,000	12.5	27,100
Gear lubricants (automotive)	45,244	33.3	15,100
Gear lubricants (industrial)	50,500	40.0	20,200
Railway diesel	51,300	18.9	9,700
Marine engine oils	35,500	24.0	5,700
Gas engine oils	41,500	2.9	1,200
Hydraulic oils	234,000	40.0	93,600
Turbine oils	84,000	60.0	50,400
Metalworking oils			
Cutting & grinding oils	64,000	20.0	12,800
Rolling & stamping oils	17,600	40.0	7,000
Quenching & tempering oils	7,500	50.0	3,700
Rust preventatives	8,500	Nil	0
Transformer oils	98,000	Nil	0
Miscellaneous	97,800	30.0	29,340
TOTAL	2,143,164	31.4	668,840

Source: Department of Energy Report prepared by Richard J. Bigda & Associates.

Rerefining Processes—The Advantages and Disadvantages

Process	Implementation	Product Quality	Process Yield	Process Energy Requirements	Process Complexity	Hazardous Waste	Additional Advantages
Acid Clay	EPA restrictions closed or forced changes in most facilities.	Can produce a quality lube oil. SF oils may be a problem	Low 65 pct when processing used automotive lube oils.	Low 12,000 Btu per gallon of product.	Simple, and readily adaptable to small volumes & batch operations.	Generates hazardous waste.	Suited to small installations with regional disposition.
Clay	Most widely used.	Questionable for highly contaminated oils acceptable for industrial oils.	Low 60 pct for automotive lubes and high 90 pct for industrial oils.	Same as acid-clay 12,000 Btu per gal. of product.	Very simple.	Generates hazardous waste.	Mostly used for pre-treatment of used oil to be burned.
Caustic-Clay	Limited use, only one plant known to exist and produces automotive lube oil.	Although thought questionable for highly contaminated oils, production of a quality lube oil is claimed.	Low lube oil yield 62 pct offset by concurrent production of fuel oil, 16 pct.	About 40 pct higher than acid-clay 17,000 Btu per gallon of product if all energy is charged to lube production.	Comparable to acid-clay processes.	Generates hazardous waste.	Similar to acid-clay.
Distillation Clay (RTI)	Most widely used.	Can produce good quality lube oil.	Higher than acid-clay, 75 pct.	13,000 Btu per gallon of product.	Moderate, simpler than Distillation Hydrotreating.	Will remove most classes.	Can be retrofitted to existing facilities. Simpler than other new technologies.
Propane Extraction (IFP Process)	Newly developed process with two European plants in production.	Can produce a quality product.	Despite a high yield of 82 pct claimed by process developer, a moderate yield of 70 pct is reported by plant operators to date.	Very high, more than twice as much as clay or up to 32,000 Btu per gallon of product.	Relatively complex & suited to large-scale operations.	Generates hazardous waste.	Produces good quality oil.
Distillation Hydro-(KTI)	Only one plant is currently under construction is West Germany and no U.S. installations is reported to date.	Should be capable of producing a quality lube oil.	Significantly higher than acid-clay, 76 pct.	Slightly higher than for acid-clay 13,000 Btu per gallon of product.	Somewhat complex & suited to large-scale continuous operations.	Will remove most classes of hazardous waste.	Simpler than other newer technologies.
BETC ST/D	Pilot plant operation has produced rerefined oil for engine sequence & field tests.	Producing high quality oil that passed all engine sequence tests for an SE oil rating (the commercial spec).	Higher than acid-clay, 75 pct.	20,000 Btu per gallon of product.	Relatively complex.	Will remove most classes of hazardous waste.	Possible to retrofit to a degree into existing acid-clay or virgin petroleum.
Phillips Rerefined oil (PROP)	Pilot test completed. two commercial size plants are NC and Canada.	Met Military (MIL-L-46152A) specification requirements for administrative fleet usage.	75-80 pct	Not available	Similar in complexity to distillation hydrotreating BETC.	Will remove some classes of hazardous waste.	Turn key plant. Big oil, backing.
MZF Solvent	Lab test tube stage. Process evaluation based on this data. Has least development work of all the processes reported.	Lab date reports good removal of metallic contaminants which should produce quality lube-oil after undergoing subsequent fractionation and clay contacting.	Significantly higher than acid-clay process, 76 pct.	Greater than twice as much as acid-clay up to 25,000 Btu per gallon of product.	Should be comparable solvent extraction processes and suited for semi-continuous or batch operations.	Unknown	Insufficient information.

Source: Department of Energy

and a surprisingly strong demand for used lube oils (a lot of gallons are still used as fuel, after some clean-up).

So, why would corporations put up big ticket money for a stake in what seems—at first glance—to be a declining industry.

Richard Bigda, head of Bigda Associates, Tulsa, Okla., says "A recycler (of used lube oils) must pay the same price for waste oil as a buyer who merely wants to use it for fuel, and can't sell it for much over 80¢ per gal."

He adds, "The EPA has been talking about fuel oil restrictions by 1985. And some states, like Oklahoma and New Jersey and Illinois, have already restricted waste oil use as a fuel. There's also a rise in internal reprocessing of waste oil by U.S. manufacturing companies. They want to eliminate the problem of disposal of waste oil, about as much as they want to cut their total oil bill."

Heat treaters, he notes, already typically treat their own quench oil for reuse.

Like the shrinkage in the number of foundries in the U.S. in the early 1970's, the drop from 150 oil recycling companies to maybe half that number; represented a heavy fallout of smaller companies. They used the acid-clay oil reclamation process, which itself ran into environmental trouble in disposing of its waste.

Says Dennis Brinkman, senior chemist with the National Institute for Petroleum and Energy Research, "Now, there are a lot of new technologies. A new industry is emerging. We see fewer, but larger companies. There are more large plants in the planning stages. It takes about two years to get a (re-refining) plant onstream; due mainly to the slowness of getting 'government approval.' "

"Most re-refiners have no trouble selling their output. Often the oil reclaiming plants launder oil in a closed loop, with a big plant sending them its coolant and hydraulic or cutting oils, taking them back when the oils are recleaned," Mr. Brinkman says.

Dr. Jerome Collins, U.S. Department of Energy (DOE) adds, "There's competition to get waste oil. Buyers who use the waste oil for fuel can boost the price, making the cost ratio tougher for the re-refiners."

"There's a lot of re-refining and reclaiming. In fact, it's surprisingly busy right now. Companies still have waste oil and they have to do something with it, though it means someone has to market it, and even reformulate it," says Dennis Reed, sales engineer with Polar, Inc., Dayton, Ohio, and an officer of the recycling committee of the American Society of Lubricating Engineers.

Re-refiners, who strip the oil back to its basic condition, supply mainly hydraulic oil or motor oil markets, he believes. Reclaimers, which are usually smaller companies, clean up oil that can be used in coolants for machine tools. The bottom grades of waste oil end up in asphalt or heating fuel, though even these users are going to require more cleaning. Both kinds of recycling companies can make a broad product range.

Polar, Inc., itself markets virgin oil, re-refined oil, and reclaimed oil; though in recent years virgin oil prices fell to low points squeezing the re-refiner or reclaimer who usually sells at more than 10¢ a gallon under virgin oil prices.

The bulk of recycling is done by only 13 companies, though APR has 80 firms.

Mr. Kimball Morris of CAM-OR, Inc., heads a company that is completing a rebuild of former acid-clay reclaiming plant for used oil, into a re-refining plant using vacuum distillation to get 10 million gallons of re-refined oil per year.

Wave of New Plants

A grassroots plant would have cost $6 million or more. Rebuilding an older plant cost only $2.5 million, Mr. Morris notes. With 10 million annual gallons of re-refined oil from this plant, and 20 million gallons from its present re-refining plant at Westville, Ind., CAM-OR is one of the biggest of the re-refining facilities. A former APR president, Mr. Morris surmizes there are now 20 re-refining plants in the U.S., including the wave of new plants of the past two years.

"Re-refining has come a long way in a short time. Over the past five years our industry spent double the amount on research it spent in the previous 50 years."

Building now seems difficult, when oil prices are still soft.

"We wanted the newer technology. It allows us to produce high quality product, like motor oil, and that's kept us busy despite the industrial oil slump," says Mr. Morris.

With its own truck fleet, CAM-OR contracts directly with auto and steel and non-ferrous plants to remove and process their used oil. From full operations starting in 1980 and generating $8.5 million a year, CAM-OR probably hit over $18 million last year, industry sources say. This year, however despite the slow recovery in some parts of the economy, CAM-OR has been running full out. Growing businesses, and stringent quality demands, make lab and test equipment, and computers a big annual outlay, Mr. Morris says.

George Booth III, president of Booth Oil Co., Buffalo, NY, puts the cost of his company's new re-refining five million gallon plant at about $4.5 million. "For some of us, a new plant is the only logical choice for the long run. We closed an old acid-clay (reclamining) plant and built this new one for re-refining, because we saw re-refining as getting the bst long range results, including rate of return."

Booth Oil began as a reclaimer in 1922. By World War II it was supplying high quality aircraft engine oil. Caught in the decline of the used oil processing industry, it began to turn to a new technology; and now to the thin-film evaporator process for re-refining, which takes used oil down to its original chemical base.

The thin film evaporator is the heart of a re-refinery, but there's a lot more equipment so that the full plant looks like an oil cracking plant.

Booth Oil has the ability to pull about 95 pct of recoverable oil from the waste oil it takes in, to remarket oil for a full range of auto and industrial use and down to low-grade fuel as part of asphalt.

Industrial Petroleum Specialties, Inc., Ferndale, Mich., an oil reclaimer, treates used oils with alkaline chemicals, heat and a clay filter press.

"This was a 41-year-oil company, bought three years ago making only fuels, and now a full reclaimer, as well as a non-hazardous waste facility," says vice president William Katzenstein.

The company's single plant serves oil users in five states, with reclaimed cutting oils, soluble oils, drawing compounds, and base oils (to custom blenders). With industrial lubricant sales slow, Industrial Petroleum has been able to expand its waste treatment, and now it's been expanding its markets into the Sun Belt from its 2 million gallon storage in the Detroit area.

Oils in Two Streams

One problem in handling cutting oils from industrial plants, Mr. Katzenstein says, is keeping the oils in two streams to keep active sulfur-bearing oils separate from inactive sulfur oils, which might be a problem in some non-ferrous uses.

Wallover Oil Co., East Liverpool Ohio, added re-refining to its blending and compounding of industrial lubricants.

"We have a plant at Strongsville now, where 75 pct of the work is re-refining. But we can still simply reclaim

FIVE-YEAR RECORD OF SAVINGS AT A STEEL MILL THROUGH THEIR USE OF PETRO-PROCESSORS TO RECYCLE HYDRAULIC OILS

1979 & 1980	Gallons Recycled	**29,674**		
	Est. Replacement Cost	**$53,413**		
	Petro Charges	**$25,139**		
	*Savings Realized on new oil purchases		**$ 28,274**	**53 Pct**
1981	Gallons Recycled	**49,920**		
	Est. Replacement Cost	**$84,952**		
	Petro Charges	**$39,491**		
	*Savings Realized on new oil purchases		**$ 45,461**	**53 Pct**
1982	Gallons Recycled	**33,321**		
	Est. Replacement Cost	**$59,977**		
	Petro Charges	**$28,656**		
	*Savings Realized on new oil purchases		**$ 31,321**	**52 Pct**
1983 (Sept.)	Gallons Recycled	**26,600**		
	Est. Replacement Cost	**$46,780**		
	Petro Charges	**$22,876**		
	*Savings Realized on new oil purchases		**$ 23,904**	**51 Pct**
	Total Gallons Recycled		**135,515**	
	Estimated Replacement Cost		**$245,122**	
	Petro Charges		**$116,162**	
*Savings Realized over purchases of new oil				**$128,960**
*Pct Savings over new oil purchases				**52.6 Pct**

used oil, removing ater and solids," says general manager George Markwardt. The company can pump out 3 million gallons of cleaned oil into auto and industrial use, from two plant sites.

One of the critical problems in a big re-refining or reclaiming plant is an adequate supply of waste oil. People still may be burning it, or even dumping it in rare cases; but the big reprocessing plants need it in quantity and on a regular basis.

"The auto companies sell (used) oil, where once they burned it or recycled it. Both steel and auto are big suppliers of oils like rolling oils, quench oils, hydraulic oils, cutting oils," Mr. Markwardt puts it. And he adds that they seem much more efficient in their use of oils, just as oil reclaimers have carefully moved away from a one-time scavenger image, to more and more product testing of lube oils, both incoming and outgoing, and adding more of their own staff specialists in oil additives.

One of the new arrivals is Ameritech Inc., dating from 1979. President William Stofey describes what Ameritech does to clean incoming industrial lubricants: "We use chemical processing and filtration to get oxidized by-products out of the oil. Then we reanalyze it, replace missing additives, and we can put up a recycling plant for about a $500,000 investment and train people in using the equipment."

Despite the slow economic recovery, some plants have been running full out.

So, Ameritech will do recycling in a 2 million gallon per year plant, or help a customer set up his own lubricant recycling plant down to volumes as small as 500 gallons per month. It also recently bought French patent to re-refine motor oil in a solvent-extraction process. It's adding a plant of its own for mid-1984 operation.

In first quarter 1984, Mr. Stofey adds, the company will set up a recycling plant for another company, and sees this lower cost equipment helping more oil users to do their own recycling.

"Re-refiners now may recycle 4 to 6 pct of the lubricating oil used here in a year, and that's been dropping in recent years," Mr. Stofey recalls. He foresees the day when small batch machines will let even a small job shop using 10 barrels of oil do its recycling.

At least one company is planning to go into oil reclamining as a service company, using Ameritech equipment. Cold finishing mills, forgings, steel castings, die castings, heat treat, and big machining systems using lots of cutting or drawing oils or gear oils, are already customers.

Probably one of the biggest reclaimers, is Metalworking Lubricants, Inc., in the Detroit area. It has four plants in the U.S.; and three in Western Europe where it also does re-refining, points out Robert Tomlinson, vice president of sales. This company does $20 million-plus in annual sales, has plants on both coasts besides the two in the Detroit area Indianapolis. The high water content of many coolants and hydraulic fluids is a problem for reclaimers, who have to process a lot of water to recover a very small amount of saleable oil, but Metalworking Lubricants has handled fluids of only 5 pct oil content.

It also has a licensed hazardous waste site.

Metalworking Lubricants started in 1952 as supplier to a single oil company, but in 1971 began supplying a wider market, for its recycled oil. In the past two years, it's also added two supply depots to its multi-plant system.

Tough Quality Standards

"I'd say 1983 has imposed the toughest quality demands we've seen in the 20 years we've been in business," says Mr. Tomlinson. "And large customers now want almost daily deliveries, and waste has to be pulled out of their plants on a 24 hour lead time."

"The demand for capital equipment makes this business a never ending investment. We re-invest over 90 pct of our earnings, with a great rise in the past five years," Mr. Tomlinson says. Besides its plants in Europe, the company has licensees in Mexico and Taiwan.

Cincinnati Milacron Inc., which has noted the use of recycled lubricants in machining applications, also offers equipment to recycle metalworking fluids.

"We use a batch processor for individual machine tools, " says Jerry Johnson, equipment engineer at the company. "We pull fluid from the machine tool's sump and transport it to a cleaning module. We have three sizes to clean water-based coolants, soluble oils, synthetic water-based cutting fluids and semi synthetics."

The system cleans cutting fluid of tramp oil, which is removed separately; and in three following stages the fluid is automatically restored to its 'original mix.

Cincinnati Milacron, markets water-based metalworking fluids.

It's notable that a number of oil companies have looked at recycling company acquisitions. Recyclers report getting calls from larger companies including the virgin oil companies, who want to talk acquisition.

Phillips Petroleum Co., Inc., developed its own recycling system, PROP. This is a re-refining process using hydrogenation, rather than high refining temperatures to 600 deg. F. At any rate, Kenneth Neubauer, sales director for PROP, explains that the system doesn't need to vaporize the oil in a vacuum as is commonly done in re-refining.

A small PROP plant was installed in North Carolina, as a 2 million gallon per year unit, but was hampered by rules that it would process oil only for state vehicles, which didn't give it much of a stock of lubricants to re-refine.

Now, however, for Shell Canada Ltd., Phillips has a larger (9 million annual gallon) re-refining plant that came on in September; though apparently Canada Shell has also made modifications of its own in the multi-stage process to demetalize, filter, distill, and hydro-treat used oil coming from motor oil collection centers and factories, airlines and railways in Canada.

The cost is $23 million in Canadian dollars. Another PROP recycling plant is "in the late stages of startup", a 10 million annual gallon plant in the Mexico City region.

Kinetics Technology International, Monrovia, Calif., is at work on permits for two re-refining sites in the U.S. In an interview, Robert Krupp, group vice president, finance at KTI Corp., as it is widely known, agrees that the key problem in planning a big central plant is finding an area that will supply enough used lubricants as feedstock for the plant.

Viable Plant Sites

"We can see about 22 economically viable plant sites in the U.S.," Mr. Krupp says. "Of these, we see 10 that would ultimately be KTI plant sites. That is, we would design, engineer, and construct the plants."

Like the Booth Oil plant, these have at their heart Luwa thin film evaporator, but this one uses vacuum distillation and a hydrogen "finisher" as well. The first KTI plant was finished in July last year, took 1.5 years to build, is sited in Greece, and rated at 8.2 million gallons per year. That's a lot of used oil. It can recover 95 pct of the lube oil it receives, using some of its hydrocarbon intake for its own fuel needs, as process temperatures can go to the 1150 deg. F.

The technology began to develop as early as 1975, and an early plant—again built with an oil company—is in Germany. Notes Mr. Krupp on capital cost, "A virgin oil refinery costs $4 to $5 per gallon of output. A re-refinery costs only $2 per gallon of capacity."

Pfaudler Co., part of Sohio Corp., is also in the re-refining equipment market through the thin film evaporation route. It's worked with it since 1972, so qualifies as a veteran. Richard Pike, manager of Pfaudler's Engineered Systems Group, reports, "We have a couple of plants using our equipment that are coming on, and two complete systems overseas, though we've done both re-refining plants and reclaiming plants. We're gearing to lower working temperatures, and higher vacuums."

Recycling waste oil is an industry of many corporate youngsters.

The smaller industrial plant that wants to rework its own lubricants on the plant premises itself, began to get help as early as 1979 from Petro-Processors, Inc., South Holland, Ill., which brings its process equipment into a steel plant or machining plant to remove water and particles from the machine tool or oil sump.

"We can process at 200 to 500 gallons per hour," says vice president Richard Siegel, "Hooking the processor right onto a press or a rolling mill while the machinery is continuing to run. It will clean and dry the fluids, but doesn't take out the additives in the oil."

Petro-Processors is a lubricant cleaner, supplying on-site service. But: "We represent several equipment builders, who can create a small volume (300 gallons per month) cleaning unit that may have an original cost of only $2000 to $3000. A bigger company, say of several thousand gallons of lubricants per week; could get a bigger cleaning plant, at a cost of $70,000 to $200,000 to handle maybe 250 to 500 gallons per hour." A cleaning system for quench tanks in a big heat treating plant would be another example.

Another on-site machine is a portable unit. Just put two hoses in a machine tool oil sump, and the machine by Renewed Energy Corp., South Bend, Ind., will boil out water and gases, at a capital cost of as little as $11,000; or a bigger machine selling at $19,900.

General Manager Raymond Nukalla of Renewed Energy, notes that the units can be fitted to a multiple spindle drilling machine while the machine operates. The cleaning machine is fully automatic. It sounds like small plant machine, but they've gone in at Ford Motor Co., at a big plastics company who uses them for injection molding machines; printing machinery builder uses them with its water soluble grinding oils at the grinding machines.

It's an industry of many corporate youngsters. Renewed Energy is just about three years old.

Luwa Corp., based at Charlotte, N.C., builds thin film evaporators that are a central unit in many re-refining oil recovery systems. Says vice president David Ruths, "Our distillation step is the heart of the most frequently used distillation method in use today." Industry sources agree on that appraisal.

Luwa is an equipment marketer, has built oil recycling systems since the 1970's, which is a reasonably long time in this young, new technology-oriented industry. Most industry members will agree with Mr. Ruths' estimate that this is no boom the industry is seeing. But there are plants coming on stream, and more are expected.

Several factors are at work that favor re-refining and oil reclaiming. The EPA is finally, beginning to move on restructions on waste oil, both in burning and in disposal. That will force oil users to take another look at recycling. Second, oil prices should rise. That always makes recycling look better. Third, old restrictions requiring a special label on recycled oil, and forbidding its use in government vehicles in some cases; are now ended. The old "scavenger" product image of recycled oil is finally laid to rest. Fourth, any kind of disposal sites are shrinking.

For the lube oil user who wants to cut his own costs, or his disposal costs, there are now a number of routes. You can put in your own recycling equipment, often at surprisingly low cost. Or, just call up a service company, and let your fingers do the recycling. ☐

Reprints available while supply lasts. For single copy, circle No. 86 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4434.

EFFECTIVE NOVEMBER 28, 1983

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	183	192	187	141
Buffalo	9	9	9	30
Pittsburgh	210	239	223	62
Youngstown	59	87	114	43
Cleveland	138	140	137	67
Detroit	127	132	138	89
Chicago	513	513	484	290
Cincinnati	89	81	103	57
St. Louis	65	74	79	33
Southern	149	159	139	60
Western	69	74	78	43
U.S. Production	1,611	1,700	1,691	915

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton $32.78
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

Steel Production, Composite Prices

(Effective November 28, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,611	1,700	75,249	66,133
Capability Utilization Rate	55.8	58.9	55.3	47.5

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.197
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 84.50	$ 81.50	$ 79.17	$ 51.17
No. 2 bundles	$ 52.50	$ 49.17	$ 46.83	$ 38.50
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 88.50	$ 84.50	$ 84.50	$ 52.50
No. 1 steel, Philadelphia	80.50	80.50	73.50	54.50
No. 1 steel, Chicago	84.50	79.50	79.50	46.50
No. 1 bundles, Detroit	81.50	81.50	83.50	41.50
Low Phos., Youngstown	84.50	84.50	84.50	52.50
No. 1 mach'y cast., Pgh.	109.50	74.50	74.50	61.50
No. 1 mach'y cast., Phila	95.50	95.50	95.50	98.50
No. 1 mach'y cast., Chi..	111.50	109.50	109.50	103.60

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective November 28, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	68.00-69.00	67.00	11/28/83
Lead	25.00-27.00	26.00-27.00	10/27/83
Magnesium Ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-565.00	555.00	4/29/82
Zinc	49.00	46.00-49.00	10/25/83

ALUMINUM: 99.5%. COPPER (C) — cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.80-$1.90
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$394.24
Indium, dollars per troy oz.	$3.20
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$340-$350
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$9.02
Vanadium	$4.94
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 21—585.16
Nov. 22—585.10
Nov. 23—584.83
Nov. 24—Holiday
Nov. 25—584.05

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	66½	61
Yellow brass	56⅝	56½
Red brass	58⅝	58
Comm. bronze	59¼	58¼
Mang. bronze	59¼	57¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	60
No. 2 copper wire	50
Light copper	41

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	46
Light copper	37
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	28
Radiators	42

Aluminum

New mixed clips	47	—48
Old sheet	44	—45
Old cast	44	—45
Clean dry borings	44	—45

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	40	—41
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	38	—39
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	10	—11

EFFECTIVE NOVEMBER 28, 1983

MATERIALS NEWSFRONT

(Effective November 28, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 88.00	to	$ 89.00
No. 2 hvy. melting	78.00	to	79.00
No. 1 dealer bundles	110.00	to	111.00
No. 1 factory bundles (auto)	113.00	to	114.00
No. 2 bundles	56.00	to	57.00
No. 1 busheling	104.00	to	105.00
Machine shop turn.	16.00	to	17.00
Shoveling turnings	46.00	to	47.00
Cast iron borings	45.00	to	46.00
Low phos. punchings plate	109.00	to	110.00
Heavy turnings	78.00	to	79.00
No. 1 RR hvy. melting	106.00	to	107.00
Rails 2 ft. and under	111.00	to	112.00
Scrap rails, random lgth	99.00	to	100.00
RR specialties	109.00	to	110.00
No. 1 machinery cast	79.00	to	80.00
Cupola cast	72.00	to	73.00
Heavy breakable cast	30.00	to	31.00
Stainless			
18-8 bundles and solids	600.00	to	610.00
18-8 turnings	500.00	to	510.00

Chicago

No. 1 hvy. melting	$ 84.00	to	$ 85.00
No. 2 hvy. melting	77.00	to	78.00
No. 1 dealer bundles	109.00	to	110.00
No. 1 factory bundles (auto)	111.00	to	112.00
No. 2 dealer bundles	49.00	to	50.00
No. 1 busheling	102.00	to	103.00
Shredder scrap	88.00	to	89.00
Machine shop turn.	37.00	to	38.00
Mixed bor. and turn.	39.00	to	40.00
Shoveling turnings	44.00	to	45.00
Cast iron borings	53.00	to	54.00
Low phos. forge crop	106.00	to	107.00
Low phos. punchings plate ¼ in. and heavier	119.00	to	120.00
Low phos. 2 ft. and under	114.00	to	115.00
No. 1 RR hvy. melting	100.00	to	101.00
Scrap rails, random lgth	93.00	to	94.00
Reroller rails	108.00	to	109.00
Rails, 2 ft. and under	112.00	to	113.00
RR couplers and knuckles	98.00	to	99.00
RR car axles	124.00	to	125.00
No. 1 machinery cast	111.00	to	112.00
Cupola cast	99.00	to	100.00
Stove plate	100.00	to	101.00
Steel car wheels	108.00	to	109.00
Stainless			
18-8 bundles and solids	560.00	to	570.00
18-8 turnings	460.00	to	470.00
430 bundles and solids	135.00	to	140.00
430 turnings	100.00	to	105.00

Philadelphia

No. 1 hvy. melting	$ 79.00	to	$ 82.00
No. 2 hvy. melting	67.00	to	70.00
No. 1 dealer bundles	94.00	to	97.00
No. 2 dealer bundles	50.00	to	53.00
No. 1 busheling	94.00	to	97.00
Shredder scrap	91.00	to	94.00
Machine shop turn.	26.00	to	29.00
Mixed bor. and turn.	26.00	to	29.00
Shoveling turnings	44.00	to	47.00
Low phos. 5 ft. and under	92.00	to	95.00
Low phos. 2 ft. punchings	101.00	to	104.00
Electric furnace bundles	108.00	to	111.00
RR specialties	93.00	to	96.00
Rails, 2 ft. and under	106.00	to	109.00
Cupola cast	65.00	to	68.00
Heavy breakable cast	53.00	to	56.00
No. 1 machinery cast	94.00	to	97.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00	to	$ 60.00
No. 2 hvy. melting	57.00	to	58.00
No. 1 dealer bundles	81.00	to	82.00
No. 2 bundles	40.00	to	41.00
No. 1 busheling	80.00	to	81.00
Drop forge flashings	55.00	to	56.00
Machine shop turn.	31.00	to	32.00
Mixed borings and turn.	20.00	to	21.00
Shoveling turnings	31.00	to	32.00
Cast iron borings	34.00	to	35.00
Heavy breakable cast	35.00	to	36.00
Mixed cupola cast	51.00	to	52.00
Automobile cast	74.00	to	75.00
Stainless			
18-8 bundles and solids	470.00	to	480.00
18-8 turnings	350.00	to	360.00
430 bundles and solids	115.00	to	125.00

Youngstown

No. 1 hvy. melting	$ 73.00	to	$ 76.00
No. 2 hvy. melting	51.00	to	54.00
No. 1 dealer bundles	87.00	to	90.00
No. 2 dealer bundles	37.00	to	40.00
Machine shop turn.	14.00	to	17.00
Shoveling turnings	19.00	to	22.00
Low phos. plate	83.00	to	86.00
Electric furnace bundles	78.00	to	81.00
Galvanized bundles	72.00	to	75.00

Cleveland

No. 1 hvy. melting	$ 69.00	to	$ 72.00
No. 2 hvy. melting	34.00	to	37.00
No. 1 dealer bundles	87.00	to	90.00
No. 1 factory bundles	100.00	to	103.00
No. 2 bundles	23.00	to	27.00
No. 1 busheling	86.00	to	89.00
Machine shop turn.	12.00	to	15.00
Mixed bor. and turn.	12.00	to	15.00
Shoveling turnings	14.00	to	17.00
Cast iron borings	17.00	to	20.00
Cut structural & plates, 2 ft. and under	102.00	to	105.00
Low phos. punchings plate	102.00	to	105.00
Drop forge flashings	42.00	to	45.00
Foundry steel, 2 ft. & under	59.00	to	62.00
No. 1 RR hvy melting	87.00	to	90.00
Rails, 2 ft. and under	112.00	to	115.00
Rails, 18 in. and under	113.00	to	116.00
Steel axle turnings	67.00	to	70.00
Railroad cast	94.00	to	97.00
No. 1 machinery cast	97.00	to	100.00
Cupola cast	63.00	to	66.00
Stove plate	48.00	to	51.00
Stainless			
18-8 bundles	375.00	to	385.00
18-8 turnings	325.00	to	335.00
430 bundles	80.00	to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00	to	$ 69.00
No. 2 hvy. melting	51.00	to	53.00
No. 1 busheling	79.00	to	80.00
No. 1 dealer bundles	79.00	to	80.00
No. 2 bundles	35.00	to	36.00
Machine shop turn.	15.00	to	16.00
Mixed bor. and turn.	13.00	to	14.00
Shoveling turnings	17.00	to	18.00
Cast iron borings	15.00	to	16.00
Low phos. plate	79.00	to	80.00
Structural and plate, 2 ft. and under	84.00	to	85.00
Rails, 2 ft. and under	89.00	to	90.00
Scrap rails, random lgth	74.00	to	75.00
No. 1 machinery cast	84.00	to	85.00
No. 1 cupola cast	64.00	to	65.00

St. Louis

No. 1 hvy. melting	$ 72.00	to	$ 73.00
No. 2 hvy. melting	61.00	to	62.00
Foundry steel, 2 ft.	61.00	to	62.00
No. 1 dealer bundles	72.00	to	73.00
No. 2 bundles	58.00	to	59.00
Machine shop turn.	20.00	to	21.00
Shoveling turnings	27.00	to	28.00
Cast iron borings	38.00	to	39.00
No. 1 RR hvy. melting	81.00	to	82.00
Rails, random length	78.00	to	79.00
Rails, 18 in. and under	94.00	to	95.00
RR specialties	87.00	to	88.00
Cupola cast	70.00	to	71.00
Heavy breakable cast	48.00	to	49.00
Stove plate	75.00	to	76.00
Cast iron car wheels	49.00	to	50.00
Rerolling rails	99.00	to	100.00
Unstripped motor blocks	57.00	to	58.00

Birmingham

No. 1 heavy melting	$ 70.00	to	$ 71.00
No. 2 heavy melting	66.00	to	67.00
No. 1 dealer bundles	72.00	to	73.00
No. 2 bundles	52.00	to	53.00
No. 1 busheling	72.00	to	73.00
Shredder scrap	94.00	to	95.00
Machine shop. turn.	24.00	to	25.00
Shoveling turnings	32.00	to	33.00
Cast iron borings	33.00	to	34.00
Electric furnace bundles	67.00	to	68.00
Elec. furnace, 3 ft. & under	75.00	to	76.00
Structural and plate, 2 ft.	97.00	to	98.00
Structural and plate, 4 ft.	92.00	to	93.00
No. 1 RR hvy. melting	94.00	to	95.00
Scrap rails, random lgth.	88.00	to	89.00
Rails, 18 in. and under	100.00	to	101.00
Angles and splice bars	94.00	to	95.00
No. 1 cupola cast	87.00	to	88.00
Unstripped motor blocks	69.00	to	70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 66.00	to	$ 67.00
No. 2 hvy. melting	59.00	to	60.00
No. 1 dealer bundles	76.00	to	77.00
No. 2 bundles	33.00	to	34.00
Machine shop turn.	11.00	to	12.00
Shoveling turnings	13.00	to	14.00
Cast iron borings	18.00	to	19.00
Low phos. 18 in. and under	95.00	to	96.00
Rails, random length	74.00	to	75.00
Rails, 2 ft. and under	92.00	to	93.00
No. 1 cupola cast	70.00	to	71.00
Heavy breakable cast	36.00	to	37.00
Drop broken cast	84.00	to	85.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 40.00	to	$ 45.00
No. 2 hvy. melting	37.00	to	40.00
No. 2 dealer bundles	23.00	to	27.00
Mixed bor. and turn.	11.00	to	13.00
Machine shop turn.	6.00	to	7.00
Shoveling turnings	14.00	to	15.00
Clean cast. chem. borings	35.00	to	36.00
No. 1 machinery cast	89.00	to	90.00
Mixed yard cast	45.00	to	46.00
Heavy breakable cast	10.00	to	12.00
Stainless			
18-8 prepared solids	490.00	to	510.00
18-8 turnings	390.00	to	410.00
430 prepared solids	70.00	to	80.00
410 solids	60.00	to	70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00	to	$ 52.00
No. 2 hvy. melting	40.00	to	42.00
No. 1 dealer bundles	68.00	to	70.00
No. 2 bundles	33.00	to	35.00
No. 1 busheling	68.00	to	70.00
Shredder scrap	68.00	to	70.00
Machine shop turn.	8.00	to	10.00
Shoveling turnings	13.00	to	15.00
No. 1 machinery cast	90.00	to	95.00
Mixed cupola cast	40.00	to	42.00
Heavy breakable cast	10.00	to	12.00

San Francisco

No. 1 hvy. melting	$ 44.00	to	$ 46.00
No. 2 hvy. melting	36.00	to	38.00
No. 1 dealer bundles	29.00	to	31.00
No. 2 dealer bundles	13.00	to	15.00
Machine shop turn.	6.00	to	8.00
Cast iron borings	6.00	to	8.00
No. 1 cupola cast	73.00	to	75.00

Los Angeles

No. 1 hvy. melting	$ 40.00	to	$ 42.00
No. 2 hvy. melting	29.00	to	31.00
No. 1 dealer bundles	27.00	to	29.00
No. 2 dealer bundles	10.00	to	12.00
Machine shop turn.	6.00	to	8.00
Shoveling turnings	10.00	to	12.00
Cast iron borings	6.00	to	8.00
Elec. furnace, 1 ft. and under (foundry)	73.00	to	75.00
No. 1 cupola cast	75.00	to	77.00

Seattle

No. 1 hvy. melting	$ 61.00	to	$ 63.00
No. 2 hvy. melting	50.00	to	52.00
No. 2 bundles	40.00	to	42.00
No. 1 cupola cast	96.00	to	98.00
Mixed yard cast	83.00	to	85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 65.00
No. 2 heavy melting cut 2 ft. and under	62.00
No. 1 dealer bundles	70.00
No. 2 bundles	38.00
Mixed steel scrap	44.00
Bush. new fact. prep'd.	68.00
Bush. new fact. unprp'd.	60.00
Machine shop turn.	33.00
Short steel turn.	36.00
Mixed bor. and turn.	23.00
Cast scrap	58.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 79.00	to	$ 80.00
No. 2 hvy. melting	63.00	to	65.00
No. 2 bundles	41.00	to	43.00
Machine shop turn.	22.00	to	23.00
Crushed turnings	44.00	to	46.00
Shredder scrap	79.00	to	80.00
Cut structural plate 2 ft. and under	94.00	to	96.00
Unstripped motor blocks	57.00	to	59.00
Cupola cast	78.00	to	80.00

STEEL PRICES

Producer Key
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P13	Penn Dixie Steel Corp., Kokomo, Ind.
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

Steel Service Center Prices

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	23.40	30.03	31.43	31.11	22.38	22.27	17.82	31.22	38.37	50.60	69.58	73.19
Baltimore	25.09	29.89	35.62	40.13	23.60	28.11	20.19	37.78	56.15	65.06	71.57	76.32
Birmingham	19.00	31.75	32.11	31.28	21.93	24.25	17.97	30.71	49.31	68.90	68.16	74.43
Boston	28.40	32.27	35.24	45.18	32.96	30.79	21.20	34.51	49.75	57.97	66.62	73.15
Buffalo	26.29	33.95	38.37	40.89	30.94	27.55	18.16	37.91	40.10	47.82	55.33	63.40
Chicago	26.61	32.45	34.67	33.78	22.92	23.88	16.74	31.87	36.14	40.45	46.33	52.53
Cincinnati	26.32	31.88	34.49	30.09	23.18	24.34	16.65	30.75	36.03	40.33	45.58	50.75
Cleveland	26.99	32.63	35.29	33.62	32.55	26.87	16.59	31.20	35.76	39.98	44.02	50.99
Denver	33.50	39.20	38.65	40.27	31.40	31.40	20.43	44.16	45.17	59.06	66.90	72.22
Detroit	27.13	33.31	36.11	32.71	25.31	27.51	17.40	30.54	36.14	40.44	48.03	52.99
Houston	26.10	31.52	35.30	42.46	30.23	30.05	20.65	41.47	45.65	51.86	56.36	64.71
Kansas City	23.76	28.88	33.66	31.59	23.80	28.64	16.15	38.74	45.33	48.63	52.20	59.20
Los Angeles	26.97	33.40	37.56	47.04	32.50	36.17	29.04	41.14	63.36	70.46	76.95	73.22
Memphis	25.07	32.01	33.06	33.37	25.89	27.30	18.99	34.76	36.78	49.96	59.60	69.44
Milwaukee	26.87	32.57	34.90	29.89	23.09	24.27	16.19	29.96	36.12	45.51	45.23	56.34
New York	25.80	33.21	36.97	44.64	30.83	29.48	20.17	41.14	46.00	51.91	61.12	63.63
Philadelphia	27.52	33.09	37.41	39.96	29.01	28.51	19.74	36.64	46.41	53.60	63.90	70.57
Pittsburgh	29.26	35.44	37.92	41.99	32.96	29.51	20.41	32.56	46.10	53.08	60.27	68.22
Portland	25.66	33.27	38.17	31.11	31.04	34.76	27.50	44.85	49.78	57.74	70.44	....
San Francisco	27.75	34.12	38.15	46.06	33.06	35.40	27.00	39.54	60.16	71.07	78.29	85.66
Seattle	27.74	32.32	36.16	40.49	27.49	30.10	28.45	50.60	63.37	71.57	76.28	87.67
Spokane	21.00	30.34	34.28	37.91	33.00	33.75	21.60	43.01	43.20	47.52	....	58.32
St. Louis	25.72	3[illegible].86	33.84	32.25	25.17	24.38	16.92	32.64	37.68	42.41	49.84	56.46
St. Paul	25.72	29.51	32.90	36.25	26.33	24.97	17.70	32.93	36.16	41.16	45.76	52.07

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2¹⁵/₁₆; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅛" round; Cold drawn—1" round; Hot-rolled 4140—1⅛" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

STEEL PRICES

Codes identify Producers listed in the Key on page 97. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	21.45
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
K1	20.85
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
R7, S10	29.60
P15	24.80
S7	Cmp*
U1	38.30
D1(1)	Cmp*
B4	33.60
Midwest	
G4	24.80
I4	35.30
W14	22.95
S1, J4	34.05
T4	Cmp*
S1	37.05

*Composite pricing

High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, I4, J3, G2, I3	22.05
A7	22.05
S1	23.75
West	
K1	22.05
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge, East	
R7	29.00
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
G4	25.80
I4	23.70
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
R7	32.75
B4	47.25
P15	32.10
Midwest	
I4	41.80
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	21.15
U1, W5, S1, B3	23.75
West	
U1	24.25
K1	22.05
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
K1	27.15
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
K1	$26.79
U1	28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
K1	$21.99
U1	22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
K1	$24.01
U1	25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢

**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled	
(Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7	23.95
U1, I3, I4, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	22.25
B4	31.00
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	19.80
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	24.85
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	25.65
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	22.70
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6, O2	24.25
K1	23.50
U1, B3	25.75
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	30.55
K1	31.30
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

METALWORKING PRICE TRENDS

Price movements, although modest, continue upward

Producers prices in October supported the upward trend ongoing for most of the year. The Bureau of Labor Statistics' October figures were up 0.3 pct compared with the previous month.

However, the index for finished consumer goods other than foods and energy was unchanged in October, according to the government. The October index for passenger vehicles and light motor trucks turned up, reflecting price hikes for 1984 model year vehicles by domestic producers. There had been decline in September in that index because of end-of-model-year allowances and other incentives.

The October index for factory, construction and other capital equipment moved up 0.3 pct in price following a 0.3 pct drop in September.

Accounting for 22.5 pct of the producer price index, capital equipment prices are an important influence on the cost of doing business in the long run. An upturn is not good news for companies trying to expand to keep pace with economic recovery. But the BLS said the upturn resulted mainly from the increase in the index for motor vehicles as 1984 models were introduced. Prices also rose for aircraft and industrial process furnaces, but declined for railroad equipment.

A look at the figures for October shows that 11 price categories of the 22 listed on the table here went up. Metal cutting machine tools and cutting tools and accessories registered no change in October. Only four categories—metal forming machine tools, railroad equipment, bearings, and pumps, compressors and allied equipment—registered drops in October.

The 0.3 pct rise in the Producer Price Index is regarded by observers as an unusually modest showing for this stage of the country's post-recession recovery. In addition, there was stronger moderation in prices of goods further back along the production chain. This could mean there might not be the sharp rebound in prices at the wholesale level that has been predicted.

The finished goods price index in October moved up 1.3 pct from the year earlier period.

In a related development, the country's factories worked harder in October than at any time in the previous 25 months, using 78.9 pct of their capacity. Capacity utilization rates are regarded as an indicator of when to expand, modernize and hire.

Latest Month Covered: October, 1983

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	377.5	0	+ 1.4
Metal Forming Machine Tools	414.8	− 0.2	+ 1.0
Agricultural Machinery & Equip.	327.9	0	+ 3.3
Construction Machinery & Equip.	353.5	0	+ 1.7
Industrial Process Furnace & Ovens	366.7	+ 1.1	+ 2.9
Industrial Material Handling Equip.	286.2	+ 0.3	+ 0.2
Pumps, Compressors & Allied Equip.	345.1	− 0.2	− 0.9
Fluid Power Equip. (Dec. 1970 = 100)	254.0	+ 0.1	+ 2.5
Mechanical Power Transmission Equip.	315.7	0	+ 1.4
Automobiles	222.4	+ 6.9	+ 1.7
Motor Trucks—Light	282.8	+10.8	+ 3.2
Motor Trucks—Heavy	326.2	+ 8.3	+ 2.7
Railroad Equipment	355.4	− 0.6	+ 1.3
Fabricated Metal Structural Products	304.4	+ 0.2	− 0.5
Electric Motors	334.1	0	+ 6.9
Valves (Metal, Ex-Fluid Power—Dec. 1982=100)	100.1	+ 0.6	NA
Ball & Roller Bearings	322.0	− 0.1	− 1.0
Cutting Tools & Accessories	275.4	0	+ 1.3
Heating Equipment	245.0	+ 0.1	+ 2.8
Plumbing Fixtures & Brass Fittings	292.7	+ 0.4	+ 5.4
Metal Containers	338.3	0	+ 2.6
Miscellaneous Metal Products	288.2	+ 0.2	+ 1.4

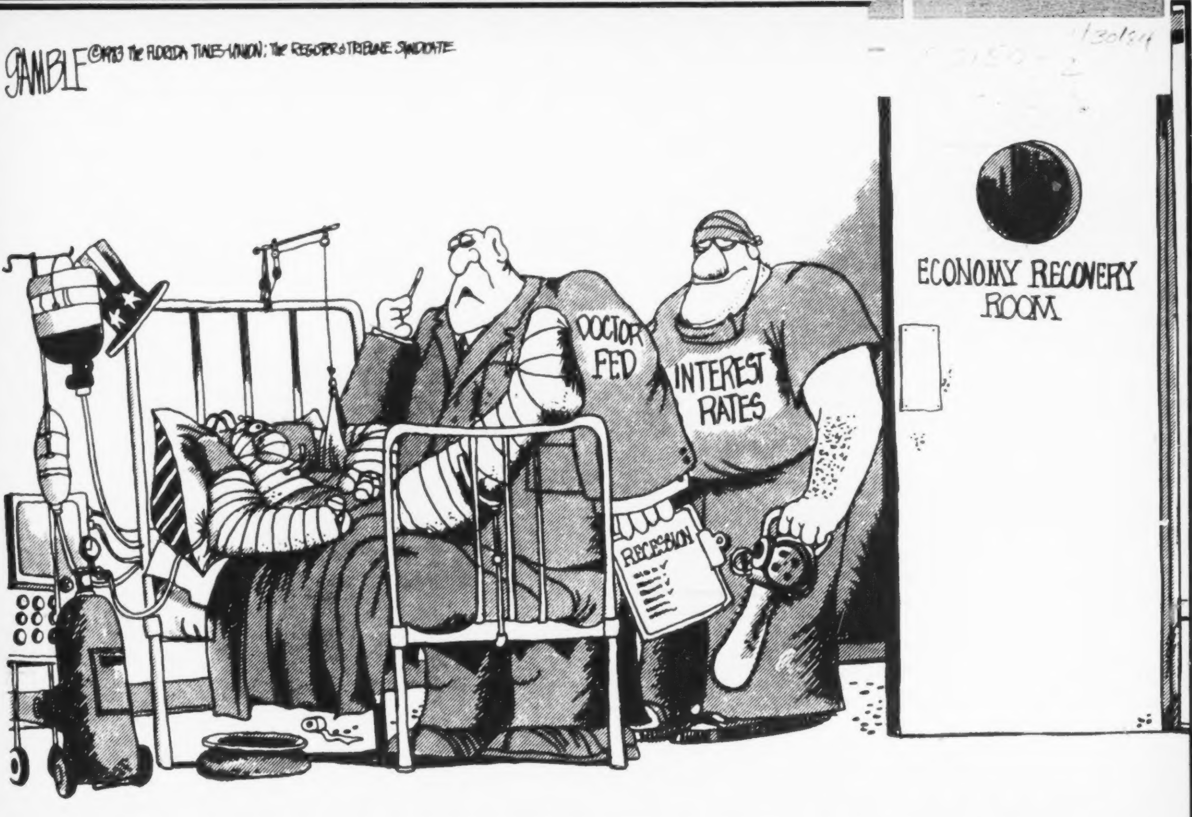
Data based on U.S. Labor Dept.'s Producer Price Index

Chilton's

DECEMBER 14, 1983

IRON AGE

THE MAGAZINE FOR METALWORKING MANAGEMENT


GAMBLE ©1983 The Florida Times-Union; The Register & Tribune Syndicate
DOCTOR FED
INTEREST RATES
RECESSION
ECONOMY RECOVERY ROOM

"WELL, YOU LOOK GOOD! HOW WOULD YOU LIKE THE SAME OPERATION OVER AGAIN?"

SCRAPBOOK OF AMERICAN BUSINESS HUMOR
3rd Annual

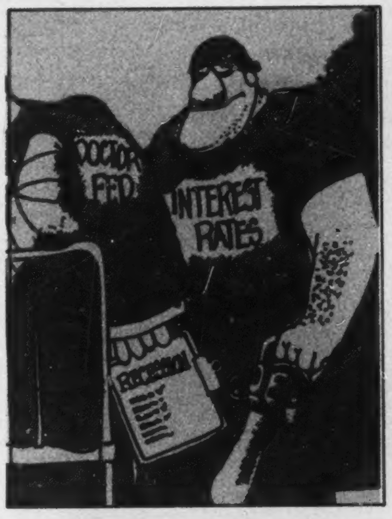
MANUFACTURING SYSTEMS SERIES 47: THE COMPUTER INVADES MAINTENANCE

PERSONAL COMPUTERS IN BUSINESS: THE SCRAMBLE FOR A BIGGER PIECE OF THE PIE

VOL. 226, NO. 30

IRON AGE

DECEMBER 14, 1983



COVER STORY

23 THIRD ANNUAL SCRAPBOOK OF AMERICAN BUSINESS HUMOR
America's top cartoonists had a field day in 1984, blasting away at industry and government officials, top to bottom. Little escaped their wit and irony, including the deficit, economic recovery, the environment and foreign policy.

FEATURES

44 MMS SERIES 47: MAINTENANCE SYSTEMS
Maintenance—preventive, predictive or emergency repair—is critical. So, if manufacturers hope to keep that expensive production equipment up and running their maintenance systems must move in new directions.

51 PERSONAL COMPUTERS HEAD FOR THE FACTORY FLOOR
Although they've secured a substantial beachhead in offices, personal computers face a host of obstacles in their bid for a role in manufacturing operations.

NEWSFRONTS

7 EDITORIAL
Not with a ten-foot pole, I wouldn't

15 METALWORKING NEWSFRONT
A Federal trade court says the government should take a more critical look at the data it receives from foreign steelmakers.

41 TECHFRONT
Plasma fabricates ceramic powders into hard, dense shapes. A three-step process strengthens soldered aluminum joints.

55 PRODUCTS NEWSFRONT
Gamma Products' GPC 1000 severe environment terminal family may be used either as a slave, or stand-alone, unit.

63 MATERIALS NEWSFRONT
Steel orders continue to climb, but mill officials fear an inventory buildup could slow the pace of the recovery.

76 METALWORKING ORDER TRENDS
Durable goods orders continued at a healthy pace in October, led by gains in aircraft and parts, and electrical machinery.

DEPARTMENTS

11 EDITORIAL STAFF
13 INDUSTRIAL BRIEFS
66 BUSINESS STAFF
66 AD INDEX
67 MANAGEMENT SERVICE CARD
70 P&P DATA 12/5
71 FERROUS SCRAP 12/5
74 CLEARING HOUSE

NEXT ISSUE

1984; Paydirt!
After a long wait.

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089, appearing on the first Monday and third Friday each month. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

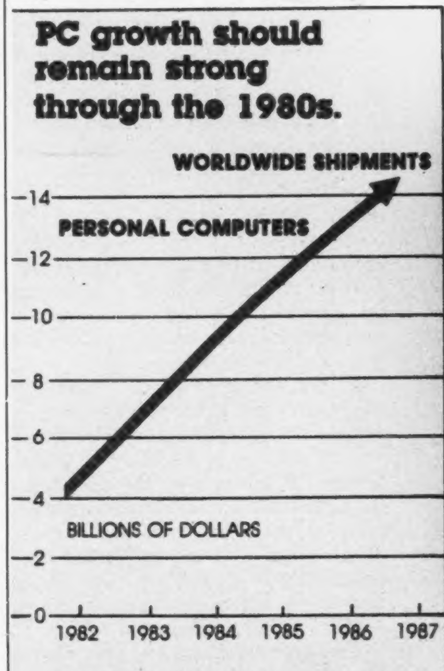
PERSONAL COMPUTERS LOOK FOR ROOM ON THE FACTORY FLOOR

Though widely accepted for office use, the personal computer faces a host of obstacles in its bid for a role in manufacturing operations.

BY ROBERT E. HARVEY

Personal computers (PCs) are beginning to make their mark in the office. They are used to communicate, calculate and organize. They are being networked so that they can talk to each other, share resources (like a printer), and communicate with large, mainframe computers. In short, they have secured a substantial beachhead.

In manufacturing areas, personal computer use is also on the rise, but there the beachhead is more tenuous. Computers supporting shop operations are in an environment more hostile than the front office. They are confronted with a wide variety of exotic control equipment, an unfriendly management information services (MIS) department, and little possibility of network support.



PC growth should remain strong through the 1980s.

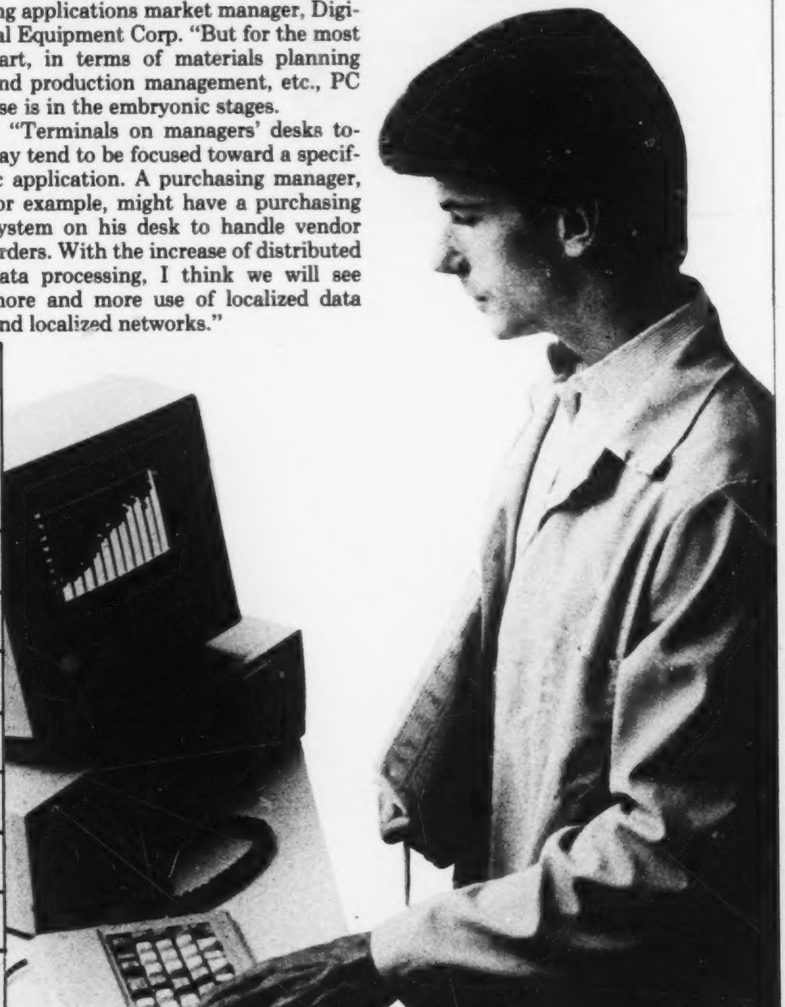
DATA: DATAQUEST INC., INTERNATIONAL DATA CORP.

Despite the obstacles, many predict an explosion of PC use in manufacturing support operations.

"We have not even begun to see PCs used in manufacturing. Most of the applications so far have been spread sheets, financial packages, that kind of thing," says Peter Zotto, manufacturing applications market manager, Digital Equipment Corp. "But for the most part, in terms of materials planning and production management, etc., PC use is in the embryonic stages.

"Terminals on managers' desks today tend to be focused toward a specific application. A purchasing manager, for example, might have a purchasing system on his desk to handle vendor orders. With the increase of distributed data processing, I think we will see more and more use of localized data and localized networks."

The personal computer revolution will arrive when the purchasing manager, the process planner and the rest, begin to realize that personal computers offer them the ability to exercise more control over their work. As opposed to being tied into some type of computerized factory system, the PC gives a manager the ability to find out



A Survey of Personal Computers

Company	**APPLE**	**COLUMBIA**	**DEC**	**HEWLETT PACKARD**	**IBM**
Computer	Lisa	Columbia MPC	Rainbow 100	HP-150	IBM PC
Microchip	68000 (32 bits)	8088 (16 bits)	Z80 (8 bits)/ 8088 (16 bits)	8088 (16 bits)	8088 (16 bits)
RAM (max)	1M bytes	1M bytes	256 K bytes	640K bytes	640K bytes
Operating System	Lisa	CP/M, MS-DOS	CP/M, MS-DOS	MS-DOS	PC-DOS
Languages	none (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)
	Apple Computer Inc. 10260 Bandley Drive Cupertino, CA 95014 (408) 996-1010	Columbia Data Products, Inc. 8990 Route 108 Columbia, MD 21045 (301) 992-3400	Digital Equipment Corp. 200 Baker Ave. Concord, Mass. 01742 (617) 264-4111	Hewlett Packard Personal Office Computer Div. 974 East Arques Ave. Sunnyvale, CA 94086 (408) 720-3000	IBM General Services POB 2150 Atlanta, GA 30342 (404) 238-2000

what would happen if—if he did this, or if he did that—instead of business as usual.

More importantly, the personal computer is a product that arose out of individual needs, not corporate needs. The greatest attribute of the PC is the fact that a person can get his arms around it, interact with it. It is a friendly doorway into a computerized universe. Right now, individual, personal computer-generated islands of knowledge are springing up throughout industry. The next step is to make this knowledge portable to other individuals in the firm who might need it.

"Many companies are really struggling with the whole concept of data resource management and how to handle distributed data bases," says Mr. Zotto. "It has always been a top down effort. Some companies are struggling because there is no bottom up understanding of what is happening. There are these islands of knowledge that somehow never get connected and there is no easy vehicle to connect them other than a human meeting.

"What will happen is that PC usage will make data resource management happen in the manufacturing environment, because it is going to make visible, for the first time, the availability of information on the user's terms rather than on some corporate MIS terms."

As the PC enters the factory, it will be used in three major ways, outlines Gaylan Larson, general manager, Manufacturing Productivity Div., Hewlett-Packard Co.

—As an intelligent work station.

A lot of processing can be done right at a work station if that station is intelligent. If the work station can do the work, it makes more sense to do that processing right on station instead of going through a larger computer like a main frame and waiting for a response.

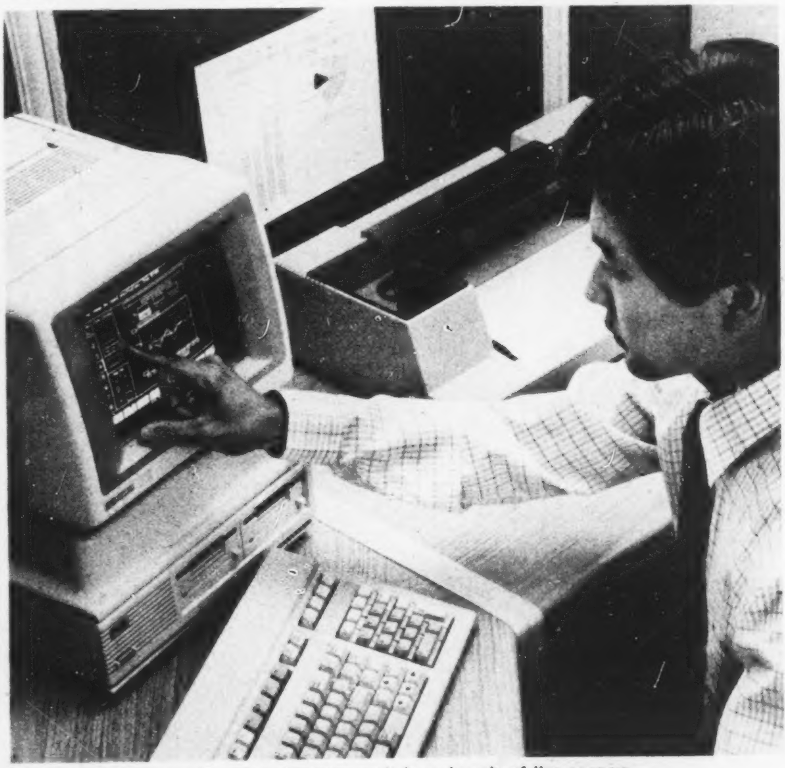
"An example of when use of this local intelligence would be beneficial is production planning," suggests Mr. Larson. "With production planning, you are iterating with a plan in order to see what happens when you twiddle this or change that."

This is asking "what if?" questions, questions like: "If I make this product, what will happen to my total output?"

This activity is modeling of a sort. On the PC, an engineer can quickly get his model straight and then update his plan on the main computer. He can effectively employ the distributed computing power available in the PC to make more timely plans and decisions.

—As a tool for analysis.

The engineer wants to know what is happening on the factory floor. A PC can help him analyze the situation.



The HP 150 personal computer responds to a touch of the screen.

KAYPRO	TANDY	SPERRY	VICTOR	WANG	XEROX
Kaypro II	Tandy TRS-80 Model 2000	Sperry PC	Victor 9000	Wang PC	Xerox 16/8
Z80 (8 bits)	80186 (16 bits)	8088 (16 bits)	8088 (16 bits)	8086 (16 bits)	8086 (16 bits)/ Z80 (8 bits)
64K bytes	256K bytes	640K bytes	894K bytes	640K bytes	128K/64K bytes
CP/M	MS-DOS	MS-DOS	MS-DOS, CP/M	MS-DOS, CP/M	MS-DOS
BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC, C (Several Optional)
KAYPRO Div. of Non-Linear Systems, Inc. 533 Stevens Ave. Solana Beach, CA 92075 (800) 447-4700	Radio Shack 1300 One Tandy Center Fort Worth, TX 76102 (817) 390-3011	Sperry Corp. Computer Systems P.O. Box 500 Blue Bell, PA 19424 (215) 5420-4213/2504	Victor Business Products 3900 North Rockwell St. Chicago, IL (312) 539-8200	Wang Laboratories Inc. One Industrial Ave. Lowell, MA 01851 (617) 851-4111	Xerox Office Products 1341 Mockingbird Lane Dallas, TX 75247 (214) 960-3000

"For example," suggests Mr. Larson, "an engineer might want to examine an automated process, so he would gather up lots of data off the main computer network, which is out there sensing what is going on and is tracking the product. Then, he would want to do some correlations with the information."

—As a control device.

Of the three ways in which a PC is now being used in the factory, its ability to control a process or another machine is the least utilized. However, instances do exist today, where a personal computer does act as a controller. IBM, for example, has introduced a robot arm that is operated by a PC. And depending on how broadly the personal computer is defined, powerful microcomputers and the newly developed supermicros already are usurping some of the control functions of the minicomputer in the factory.

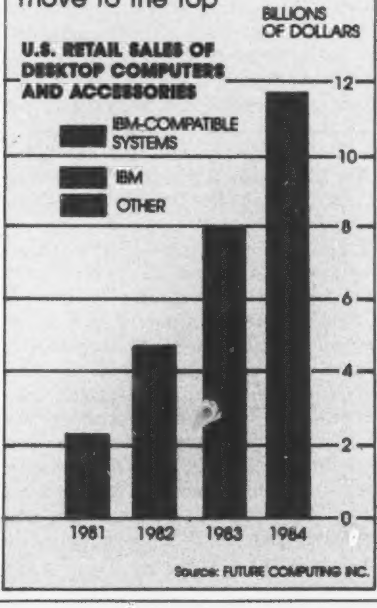
"There is a lot of activity in industry aimed at using personal computers to control processes," says Mr. Larson. "And there are a lot of small applications out there where a PC could do well. It probably could benefit a small water treatment facility which only needs to adjust the pH factor before waste gets dumped, for example. It could manage the valves and sense the conditions and then log what is happening over time."

What will this personal computer be controlling? "It could be a programmable controller, but more likely it is going to be some digital-to-analog converter boards or some boards to sense voltages from transducers measuring temperature, pH pressure, and so on," says Mr. Larson.

A number of people have reservations about the prospect of using the typical personal computer extensively for control purposes.

"The primary reason for having some sort of an intelligence in the control application is not for the sake of an operator, but for the sake of interfacing with a machine or process. And for that very reason, you have to look at what are the main functions of personal computers vs. other types of controllers," says Denny LaBarge, product manufacturing applications marketing manager, Digital Equipment. "I would maintain that the orientation and the requirements for the process interface will drive us to keep the controller concept alive. And as control becomes more sophisticated, quite honestly you reduce your requirements for operator interface."

IBM PCs and IBM compatibles move to the top



Source: FUTURE COMPUTING INC.

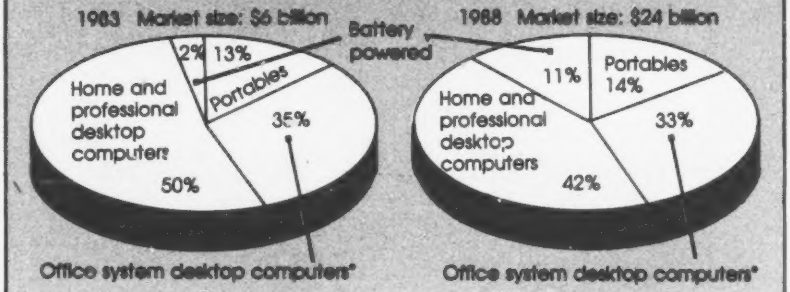
Instead of a PC, a microcomputer or a supermicrocomputer probably would work better for control. These devices, although more expensive than a PC, are much more capable of doing multiprogramming functions. In other words, they can handle a multitude of tasks while interfacing with an operator.

"While I don't see the PC being too heavily involved in process or machine control, I see it serving to support engineering and office-related functions out in the factory," says Mr. LaBarge. "There may be oases out in a factory, oases of clerical expertise, for example, that could use a PC to help determine things like work loads."

With its planning and analyzing abilities, the PC is moving deeper into the factory and closer to where the action is. At present, for all the factory applications for the PC, the computer is still housed in a relatively clean environment—usually an air conditioned office. But eventually, it should begin appearing on the shop floor.

"There are some discussions underway at Digital about the possible ruggedization of a PC, so perhaps it can be stuck on a desk right in the production area with minimal protection around it," says Mr. LaBarge. Housed in a rugged cabinet, the PC could then be used by a shop floor foreman.

As it spreads out into the factory, the personal computer will become involved in an increasing number of factory operations. "One area where personal computers definitely will have an impact is quality control," says Mr. LaBarge. "Considering the station orientation of a lot of quality applications, there is a definite possibility for putting personal computers into that



The personal computer market: 1983 and 1988

(the projected retail value of PCs above $1,000)

* Desktop computers with "hard disk", or high capacity disk memory system.

Source: Future Computing Inc.

environment."

At these stations, reliability engineers would perform tests on work-in-progress and incoming piecework. They would run analyses, do historical trending, and anything else that goes with the quality process.

—IBM and standards.

One of the major problems of adapting PCs to a factory environment is incompatability, incompatibility with rival PCs and with other computer systems. Every PC can operate only in a particular range of software. Often, software packages that can operate on one type of PC cannot operate on another.

The lack of software standards for the PC, however, may be coming to an end. A trend clearly is developing to build computers that are more or less compatible with the IBM PC. For example, in the past month, three companies—Sperry Corp., Tandy Corp., and ITT Corp.—jumped on the IBM bandwagon.

All told, over a dozen firms have produced computers that are compatible to some degree with IBM software. All the firms that are somewhat compatible with IBM use the same operating system: MS-DOS.

The operating system mediates between the physical computer and applications software that enables the computer do a specific task, such as word processing or accounting. However, just because two computers use the same operating system, it does not automatically follow that they are completely compatible.

"The PC that we brought to the marketplace, which is MS-DOS and bit-for-bit compatible with the IBM PC, was done for the specific reason that we believe that the IBM PC has established a standard and will be important as a standard in the world market," reports Robert C. Rosenbaum, director of network systems marketing, Sperry Corp. "In addition, we believe that the PC has got to be able to connect with the bigger world."

To forge this connection, Sperry built in asynchronous communications and provided asynchronous software. Sperry's designers also made sure their PC could communicate with IBM and Sperry systems.

"With all its potential communications links, Sperry is now looking at ways to combine its PC with other equipment in order to offer specific systems packages to the marketplace—looking at how we tie it into units, how we tie it into CAD/CAM, for example, how we put it together into a usable system. We see that if we just make the PC communicate with Sperry mainframes, we eliminate a significant marketplace," says Mr. Rosenbaum.

More and more firms are trying to challenge IBM at its game rather than starting up their own game this late in the season. Sperry plans to compete with IBM by reportedly offering 50 pct more internal speed than the IBM PC as well superior displays and color graphics. Sperry is also aiming at producing a machine that sells for 10 pct less than the IBM.

IBM's long shadow also has fallen over the Tandy Corp. It is introducing a IBM-compatible PC, making Apple reportedly the only major manufacturer that has not adopted IBM's operating system, and even Apple reportedly will conform in the future.

With the introduction of its TRS-80 Model 2000, Tandy wants to change its image as a computer maker. To help sell the offering to businessmen who think that Radio Shack products are not primarily geared for the office, Tandy dropped 'Radio Shack' from the new computer's name. Tandy executives state that the new machine will be faster than the IBM, have more disc storage, and will cost less.

ITT, attempting to become a computer power after a late start, has also announced that its new personal computer is IBM compatible. The ITT Xtra, which will be available in April, will be slightly cheaper than the IBM and the first in a long line of office automation products, say ITT officials.

Another product that will be available next year is Hewlett-Packard's HP-150. It also is somewhat compatible with the IBM PC, running the MS-DOS operating system.

But the HP-150 has several features that potentially make it well suited for the industrial environment.

The new computer features a touchscreen display, which means that operators can run computer programs with a touch of a finger or a pen.

"We see two main advantages of this product for factory operations," reports Mr. Larson. "One is that touchscreen means easier interaction for the operator. You can draw pictures and write things on the screen and all the operator has to do is touch them, so ease of use becomes rapidly intuitive. Another thing is that we don't have to have a keyboard and the touch screen is much more reliable in contaminated environments.

In discussion of personal computers, IBM and its recent impact on the PC market cannot be overlooked.

"When IBM entered the PC marketplace, everyone assumed that, as always, IBM would make its mark. But nobody assumed that IBM would be accepted as well as they have been," explains Thomas S. McCaffrey, vice president, worldwide marketing, Sperry. "A primary reason for IBM's success was their offering of an 'open system.' Almost any information that a third party needed to develop either hardware or software was made available. The result: many application programs were written for what grew into a huge market and the IBM personal computer became the predominant PC, with the largest selection of applications available today."

Today, Sperry, Tandy, Hewlett-Packard and a number of other computer manufactures are using MS-DOS and are compatible in some degree to the IBM computer. And even if software, designed specifically for IBM is not completely compatible with a Sperry or a Tandy PC, a software producer can, without a great deal of trouble, alter the software to accommodate the non-IBM computer.☐

Reprints available while supply lasts. For single copy, circle No. 90 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4438

EFFECTIVE DECEMBER 5, 1983

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	194	183	179	138
Buffalo	9	9	9	30
Pittsburgh	227	210	233	80
Youngstown	89	59	112	50
Cleveland	141	138	142	61
Detroit	136	127	138	114
Chicago	516	513	497	268
Cincinnati	90	89	76	54
St. Louis	73	65	75	32
Southern	159	149	139	62
Western	76	69	73	45
U.S. Production	1,710	1,611	1,673	934

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton $32.78
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

Steel Production, Composite Prices

(Effective December 5, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,710	1,611	76,959	67,064
Capability Utilization Rate	59.3	55.8	55.3	47.2

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 86.17	$ 84.50	$ 79.17	$ 51.17
No. 2 bundles	$ 54.50	$ 52.50	$ 47.50	$ 38.50
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 90.50	$ 88.50	$ 84.50	$ 52.50
No. 1 steel, Philadelphia	83.50	80.50	73.50	54.50
No. 1 steel, Chicago	84.50	84.50	79.50	46.50
No. 1 bundles, Detroit	86.50	81.50	81.50	41.50
Low Phos., Youngstown	88.50	84.50	84.50	51.50
No. 1 mach'y cast., Pgh	79.50	79.50	74.50	61.50
No. 1 mach'y cast., Phila	97.50	95.50	95.50	98.50
No. 1 mach'y cast., Chi	111.50	111.50	109.50	103.60

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective December 5, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	69.00-71.00	68.00-69.00	11/29/83
Lead	25.00-27.00	26.00-27.00	10/27/83
Magnesium Ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	49.00	46.00-49.00	10/25/83

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.80-$1.90
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$397.25
Indium, dollars per troy oz.	$3.20
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$330-$340
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$9.34
Vanadium	$4.94
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 28—584.05
Nov. 29—582.70
Nov. 30—583.38
Dec. 1—580.75
Dec. 2—578.68

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	66½	61
Yellow brass	57½	56½
Red brass	61¼	58
Comm. bronze	61	58¼
Mang. bronze	59¼	57¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	52
Light copper	[illegible]3

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	48
Light copper	39
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	28
Radiators	42

Aluminum

New mixed clips	46	—47
Old sheet	43	—44
Old cast	43	—44
Clean dry borings	43	—44

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	40	—41
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	38	—39
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	10	—11

MATERIALS NEWSFRONT

(Effective December 5, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 90.00	to	$ 91.00
No. 2 hvy. melting	80.00	to	81.00
No. 1 dealer bundles	110.00	to	111.00
No. 1 factory bundles (auto)	113.00	to	114.00
No. 2 bundles	59.00	to	60.00
No. 1 busheling	106.00	to	107.00
Machine shop turn.	16.00	to	17.00
Shoveling turnings	46.00	to	47.00
Cast iron borings	45.00	to	46.00
Low phos. punchings plate	109.00	to	110.00
Heavy turnings	80.00	to	81.00
No. 1 RR hvy. melting	106.00	to	107.00
Rails 2 ft. and under	111.00	to	112.00
Scrap rails, random lgth.	99.00	to	100.00
RR specialties	109.00	to	110.00
No. 1 machinery cast	79.00	to	80.00
Cupola cast	72.00	to	73.00
Heavy breakable cast	30.00	to	31.00
Stainless			
18-8 bundles and solids	600.00	to	610.00
18-8 turnings	500.00	to	510.00

Chicago

No. 1 hvy. melting	$ 84.00	to	$ 85.00
No. 2 hvy. melting	77.00	to	78.00
No. 1 dealer bundles	111.00	to	112.00
No. 1 factory bundles (auto)	111.00	to	112.00
No. 2 dealer bundles	49.00	to	50.00
No. 1 busheling	105.00	to	106.00
Shredder scrap	95.00	to	96.00
Machine shop turn.	39.00	to	40.00
Mixed bor. and turn.	40.00	to	41.00
Shoveling turnings	46.00	to	47.00
Cast iron borings	55.00	to	56.00
Low phos. forge crop	109.00	to	110.00
Low phos. punchings plate ¼ in. and heavier	123.00	to	124.00
Low phos. 2 ft. and under	118.00	to	119.00
No. 1 RR hvy. melting	100.00	to	101.00
Scrap rails, random lgth.	93.00	to	94.00
Reroller rails	108.00	to	109.00
Rails, 2 ft. and under	112.00	to	113.00
RR couplers and knuckles	98.00	to	99.00
RR car axles	124.00	to	125.00
No. 1 machinery cast	111.00	to	112.00
Cupola cast	99.00	to	100.00
Stove plate	100.00	to	101.00
Steel car wheels	108.00	to	109.00
Stainless			
18-8 bundles and solids	560.00	to	570.00
18-8 turnings	460.00	to	470.00
430 bundles and solids	135.00	to	140.00
430 turnings	100.00	to	105.00

Philadelphia

No. 1 hvy. melting	$ 82.00	to	$ 85.00
No. 2 hvy. melting	70.00	to	73.00
No. 1 dealer bundles	96.00	to	99.00
No. 2 dealer bundles	53.00	to	56.00
No. 1 busheling	96.00	to	99.00
Shredder scrap	94.00	to	97.00
Machine shop turn.	26.00	to	29.00
Mixed bor. and turn.	26.00	to	29.00
Shoveling turnings	45.00	to	48.00
Low phos. 5 ft. and under	94.00	to	97.00
Low phos. 2 ft. punchings	105.00	to	108.00
Electric furnace bundles	109.00	to	112.00
RR specialties	94.00	to	97.00
Rails, 2 ft. and under	109.00	to	112.00
Cupola cast	67.00	to	70.00
Heavy breakable cast	53.00	to	56.00
No. 1 machinery cast	96.00	to	99.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 64.00	to	$ 65.00
No. 2 hvy. melting	61.00	to	62.00
No. 1 dealer bundles	86.00	to	87.00
No. 2 bundles	42.00	to	43.00
No. 1 busheling	85.00	to	86.00
Drop forge flashings	60.00	to	61.00
Machine shop turn.	33.00	to	34.00
Mixed borings and turn.	20.00	to	21.00
Shoveling turnings	33.00	to	34.00
Cast iron borings	41.00	to	42.00
Heavy breakable cast	35.00	to	36.00
Mixed cupola cast	51.00	to	52.00
Automobile cast	74.00	to	75.00
Stainless			
18-8 bundles and solids	460.00	to	470.00
18-8 turnings	340.00	to	350.00
430 bundles and solids	125.00	to	135.00

Youngstown

No. 1 hvy. melting	$ 80.00	to	$ 83.00
No. 2 hvy. melting	61.00	to	64.00
No. 1 dealer bundles	91.00	to	95.00
No. 2 dealer bundles	37.00	to	40.00
Machine shop turn.	14.00	to	17.00
Shoveling turnings	19.00	to	22.00
Low phos. plate	87.00	to	90.00
Electric furnace bundles	82.00	to	85.00
Galvanized bundles	76.00	to	79.00

Cleveland

No. 1 hvy. melting	$ 76.00	to	$ 79.00
No. 2 hvy. melting	44.00	to	47.00
No. 1 dealer bundles	94.00	to	97.00
No. 1 factory bundles	100.00	to	103.00
No. 2 bundles	23.00	to	26.00
No. 1 busheling	93.00	to	96.00
Machine shop turn.	12.00	to	15.00
Mixed bor. and turn.	12.00	to	15.00
Shoveling turnings	14.00	to	17.00
Cast iron borings	17.00	to	20.00
Cut structural & plates, 2 ft. and under	105.00	to	108.00
Low phos. punchings plate	105.00	to	108.00
Drop forge flashings	62.00	to	65.00
Foundry steel, 2 ft. & under	70.00	to	75.00
No. 1 RR hvy melting	87.00	to	90.00
Rails, 2 ft. and under	112.00	to	115.00
Rails, 18 in. and under	113.00	to	116.00
Steel axle turnings	67.00	to	70.00
Railroad cast	94.00	to	97.00
No. 1 machinery cast	97.00	to	100.00
Cupola cast	63.00	to	66.00
Stove plate	48.00	to	51.00
Stainless			
18-8 bundles	375.00	to	385.00
18-8 turnings	325.00	to	335.00
430 bundles	80.00	to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00	to	$ 69.00
No. 2 hvy. melting	51.00	to	53.00
No. 1 busheling	79.00	to	80.00
No. 1 dealer bundles	79.00	to	80.00
No. 2 bundles	38.00	to	39.00
Machine shop turn.	15.00	to	16.00
Mixed bor. and turn.	13.00	to	14.00
Shoveling turnings	17.00	to	18.00
Cast iron borings	15.00	to	16.00
Low phos. plate	81.00	to	82.00
Structural and plate, 2 ft. and under	84.00	to	85.00
Rails, 2 ft. and under	95.00	to	96.00
Scrap rails, random lgth.	74.00	to	75.00
No. 1 machinery cast	84.00	to	85.00
No. 1 cupola cast	64.00	to	65.00

St. Louis

No. 1 hvy. melting	$ 77.00	to	$ 78.00
No. 2 hvy. melting	66.00	to	67.00
Foundry steel, 2 ft.	66.00	to	67.00
No. 1 dealer bundles	77.00	to	78.00
No. 2 bundles	63.00	to	64.00
Machine shop turn.	20.00	to	21.00
Shoveling turnings	27.00	to	28.00
Cast iron borings	38.00	to	39.00
No. 1 RR hvy. melting	87.00	to	88.00
Rails, random length	81.00	to	82.00
Rails, 18 in. and under	97.00	to	98.00
RR specialties	90.00	to	91.00
Cupola cast	70.00	to	71.00
Heavy breakable cast	48.00	to	49.00
Stove plate	80.00	to	81.00
Cast iron car wheels	52.00	to	53.00
Rerolling rails	102.00	to	103.00
Unstripped motor blocks	61.00	to	62.00

Birmingham

No. 1 heavy melting	$ 70.00	to	$ 71.00
No. 2 heavy melting	66.00	to	67.00
No. 1 dealer bundles	73.00	to	74.00
No. 2 bundles	52.00	to	53.00
No. 1 busheling	73.00	to	74.00
Shredder scrap	95.00	to	96.00
Machine shop. turn.	24.00	to	25.00
Shoveling turnings	32.00	to	33.00
Cast iron borings	33.00	to	34.00
Electric furnace bundles	68.00	to	69.00
Elec. furnace, 3 ft. & under	76.00	to	77.00
Structural and plate, 2 ft.	101.00	to	102.00
Structural and plate, 4 ft.	93.00	to	94.00
No. 1 RR hvy. melting	94.00	to	95.00
Scrap rails, random lgth.	88.00	to	89.00
Rails, 18 in. and under	103.00	to	104.00
Angles and splice bars	95.00	to	96.00
No. 1 cupola cast	68.00	to	69.00
Unstripped motor blocks	69.00	to	70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 66.00	to	$ 67.00
No. 2 hvy. melting	59.00	to	60.00
No. 1 dealer bundles	76.00	to	77.00
No. 2 bundles	33.00	to	34.00
Machine shop turn.	11.00	to	12.00
Shoveling turnings	13.00	to	14.00
Cast iron borings	18.00	to	19.00
Low phos. 18 in. and under	95.00	to	96.00
Rails, random length	74.00	to	75.00
Rails, 2 ft. and under	92.00	to	93.00
No. 1 cupola cast	70.00	to	71.00
Heavy breakable cast	36.00	to	37.00
Drop broken cast	84.00	to	85.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 40.00	to	$ 45.00
No. 2 hvy. melting	37.00	to	40.00
No. 2 dealer bundles	23.00	to	27.00
Mixed bor. and turn.	11.00	to	13.00
Machine shop turn.	6.00	to	7.00
Shoveling turnings	14.00	to	15.00
Clean cast. chem. borings	35.00	to	36.00
No. 1 machinery cast	89.00	to	90.00
Mixed yard cast	45.00	to	46.00
Heavy breakable cast	10.00	to	12.00
Stainless			
18-8 prepared solids	490.00	to	510.00
18-8 turnings	390.00	to	410.00
430 prepared solids	80.00	to	100.00
410 solids	70.00	to	80.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 55.00	to	$ 57.00
No. 2 hvy. melting	45.00	to	47.00
No. 1 dealer bundles	73.00	to	75.00
No. 2 bundles	35.00	to	37.00
No. 1 busheling	78.00	to	80.00
Shredder scrap	72.00	to	74.00
Machine shop turn.	10.00	to	12.00
Shoveling turnings	15.00	to	17.00
No. 1 machinery cast	90.00	to	95.00
Mixed cupola cast	45.00	to	47.00
Heavy breakable cast	14.00	to	16.00

San Francisco

No. 1 hvy. melting	$ 44.00	to	$ 46.00
No. 2 hvy. melting	36.00	to	38.00
No. 1 dealer bundles	29.00	to	31.00
No. 2 dealer bundles	13.00	to	15.00
Machine shop turn.	6.00	to	8.00
Cast iron borings	6.00	to	8.00
No. 1 cupola cast	73.00	to	75.00

Los Angeles

No. 1 hvy. melting	$ 43.00	to	$ 45.00
No. 2 hvy. melting	32.00	to	34.00
No. 1 dealer bundles	27.00	to	29.00
No. 2 dealer bundles	10.00	to	12.00
Machine shop turn.	6.00	to	8.00
Shoveling turnings	10.00	to	12.00
Cast iron borings	6.00	to	8.00
Elec. furnace, 1 ft. and under (foundry)	74.00	to	76.00
No. 1 cupola cast	75.00	to	77.00

Seattle

No. 1 hvy. melting	$ 71.00	to	$ 73.00
No. 2 hvy. melting	60.00	to	62.00
No. 2 bundles	40.00	to	42.00
No. 1 cupola cast	96.00	to	98.00
Mixed yard cast	83.00	to	85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 65.00
No. 2 heavy melting cut 2 ft. and under	62.00
No. 1 dealer bundles	70.00
No. 2 bundles	38.00
Mixed steel scrap	44.00
Bush. new fact. prep'd.	68.00
Bush. new fact. unprp'd.	60.00
Machine shop turn.	33.00
Short steel turn.	36.00
Mixed bor. and turn.	23.00
Cast scrap	58.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 82.00	to	$ 83.00
No. 2 hvy. melting	66.00	to	67.00
No. 2 bundles	41.00	to	43.00
Machine shop turn.	22.00	to	23.00
Crushed turnings	44.00	to	46.00
Shredder scrap	82.00	to	83.00
Cut structural plate 2 ft. and under	94.00	to	96.00
Unstripped motor blocks	57.00	to	59.00
Cupola cast	80.00	to	82.00

METALWORKING ORDER TRENDS

Durable orders show economic recovery gaining momentum

America's economic recovery thus far is stronger than the experts had expected.

Durable goods orders for October show the economy is sturdy and continuing strong. Overall orders received in the tenth month came to $93.8 billion, exceeding September's $90.3 billion by 3.1 pct.

The October total was also extraordinarily better than the 1982 figure of $69.8 billion.

The overall picture is a mixed bag—half of the major orders categories were up in October compared with September. Nine were down and four were unchanged. But compared with a year ago, 23 categories are up, with only three down. The increase in orders for durable goods was the largest since the 7.6 pct gain registered in June.

About 75 pct of the October increase in new orders centered in the aircraft and parts industry. Orders there were estimated at $7.6 billion, a $2.1 billion or 37 pct rise over September. The largest decline took place in the steel industry—a 6.3 pct drop to $4.6 billion from September's $4.9 billion.

Another sizeable increase in orders in October occurred in the electrical machinery sector, a $700 million rise to $15 billion.

Also, new orders in October for nondefense capital goods increased for the third consecutive month up $1.3 billion or 5.2 pct to $26.5 billion. That statistic, an indicator of business investment, suggests that companies are increasing their investment in new equipment, which could prolong the recovery.

The Commerce Department's latest quarterly survey of capital spending plans shows business expects the first half of next year to show 3.9 pct more business investment than the last half of 1983, in which spending is increasing at a 6.7 pct annual rate. The latest estimate of spending for all of 1983 is $303.2 billion, slightly less than what businesses anticipated in the July-August government survey.

Manufactured goods shipments declined for the first time since an 0.8 pct drop was registered in July. It was only the second time this year the shipments have dropped. Within the durable goods sector, shipments in virtually all major categories dropped with the exception of primary metals which went up $200 million or 2.1 pct; mainly the result of an increase in nonferrous metals shipments.

Source: U.S. Dept. of Commerce Billions of dollars, seasonally adjusted monthly total, unless otherwise noted		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
Capital Expenditures (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$326.7*	$313.0*	$303.2
Manufacturing, Total	4th Qtr.	119.8*	117.4*	110.2
Manufacturing, Durable Goods	4th Qtr.	53.7*	53.0*	50.5
Mining Industry	3rd Qtr.	14.6*	13.3*	13.4
Key Indicators, Durable Goods Manufacturing				
New Orders	Oct.	93.8	90.9	69.8
Shipments	Oct.	87.9	88.9	72.4
Inventories	Oct.	170.6	170.3	182.3
Unfilled Orders	Oct.	317.9	312.0	284.1
New Orders, Metalworking				
Capital Goods Producers, Nondefense Industries	Oct.	26.5	25.2	20.1
Capital Goods Producers, Defense Industries	Oct.	5.6	4.9	4.7
Primary Metals, Total	Oct.	10.8	11.0	6.9
Steel (SIC 331)	Oct.	4.6	4.9	2.8
Iron & Steel Castings (SIC 332)	Oct.	0.2	1.3	0.6
Nonferrous Metals	Oct.	5.0	4.8	3.5
Nonelectrical Mach.-Equip. Industries, Total	Oct.	17.2	17.2	13.9
Engines & Turbines	Oct.	1.4	0.8	1.1
Farm Machinery & Equipment (Shipments)	Oct.	0.9	0.9	1.0
Construction, Mining & Materials Hdlg. Equip.	Oct.	2.5	2.6	2.0
General Industrial Machinery	Oct.	1.5	1.3	1.0
Fluid Power Equipment** (Index-1972=100)	Oct.	270.0	276.0	152.0
Metalworking Machinery	Oct.	0.7	0.7	0.6
Machine Tools, Total (Millions $, unadjusted)***	Oct.	203.0	155.8	119.2
Machine Tools, Metal-Cutting***	Oct.	129.9	102.4	72.8
Machine Tools, Metal-Forming***	Oct.	73.1	53.3	46.3
Electrical Mach. & Equip. Industries, Total	Oct.	15.0	14.3	10.9
Elec. Transmission Equip. & Industrial Apparatus	Oct.	1.8	2.1	1.4
Household Appliances	Oct.	1.2	1.2	1.0
Communication Equipment	Oct.	4.5	4.3	3.7
Transportation Equip. Industrial, Total	Oct.	21.9	19.5	14.3
Motor Vehicles & Parts (Shipments)	Oct.	12.9	13.4	7.9
Aircraft, Missiles & Parts	Oct.	7.6	5.5	5.1
Shipbuilding & Military Tanks	Oct.	0.3	−0.05	0.7
Fabricated Metal Products, Total	Oct.	10.4	10.6	8.4
Instruments, Total	Oct.	4.2	4.3	3.7

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

C8 1/6/84
C2150-2

CHILTON'S
January 2, 1984

IRON AGE
METALS PRODUCER

WORLD ELECTRIC FURNACE REPORT: GROWTH THAT WON'T STOP

METALPRODUCING HOT SPOT: MINI vs. INTEGRATED MILL DEBATE

IN PLANT SPOTLIGHT: SHULTZ STEEL'S HIGH TECH COMMITMENT

Plus

1984 FORECAST: PAYDIRT! AFTER A LONG WAIT

and

BEYOND NEXT YEAR: INDUSTRY'S TOP EXECS OUT ON A LIMB

JANUARY 2, 1984 VOL. 227, NO. 1

CHILTON'S
IRONAGE
METALS PRODUCER

Photograph courtesy of Lukens, Inc.

1984 Annual Forecast—Paydirt! After a Long Wait 27
Label 1984 a 'Comeback Year'

STEEL 33
NONFERROUS METALS 35
AUTOMOTIVE 37
MACHINE TOOLS 38
FLUID POWER 38
COMPUTERS 39
INSTRUMENTS & CONTROLS 39
METAL COATINGS 40
PLASTICS 40
CONSTRUCTION EQUIPMENT 43
FARM EQUIPMENT 43
TUBULAR GOODS 45
MINING EQUIPMENT 45
APPLIANCES 48
MATERIAL HANDLING EQUIPMENT 48
CASTINGS 52
FORGINGS 52
AIRCRAFT 54
ENGINES & TURBINES 54
WELDING 55
HEAT TREATING 55
SCREW MACHINE PRODUCTS 56
FASTENERS 56
BEARINGS 58
STAMPINGS 58
GEARS 58
VALVES 58
SHIPBUILDING 61
RAIL CARS 61

Editorial
Why I'm not making a forecast. 7

The Hot Spot 21
Two executives debate the issue of mini vs integrated steel mills.

Top execs out on a limb 62
Some powerful leaders comment on U.S. business future.

Annual Statistical Review 95
Metals' price and production data of 1983.

Electric furnace 107
Has electric steelmaking reached an outer boundary?

In-Plant Spotlight 121
Shultz Steel makes a commitment to modernization.

Next Issue: World Metalproducing Outlook and Galvanized Steel Report

Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 18
BUSINESS STAFF 122
AD INDEX 122
MANAGEMENT SERVICE CARD 123
STEEL PRICES 127
P&P DATA 12/27 129
FERROUS SCRAP 132

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc

'84 ANNUAL FORECAST

PAYDIRT! AFTER A LONG WAIT

Just about all critical business signs now point to continued recovery through 1984.

BY JOHN D. BAXTER

Label 1984 'The Road Back.' That's what it will be for most manufacturing industries.

Recovery will be strong for them. The recovery for most metals producing and manufacturing companies this year will likely run well ahead of the growth rate of the overall U.S. economy.

It's Operation Catch-Up again—as usual for industrial goods manufacturing lines. The recovery is now in its 14th month and many manufacturing companies are just now getting up off the canvas. Starting recovery later, their quarterly gains will now be steeper than for the economy as a whole.

The U.S. economy, as measured by inflation-adjusted Gross National Product, will likely grow by more than 5 pct for 1984. This is close to a consensus view that ranges from 4.5 pct to 5.5 pct. Last year's growth came to an estimated 3.4 pct.

The growth rate for durable goods new orders in real terms this year is forecast at about 12 pct. That's 16.6 pct growth in current dollars less an inflation rate for durable goods of 4.5 pct. This growth is shown in the chart here expressed in average current dollar volume of orders per month.

That growth in durables orders, of which about 85 pct are for metals and manufacturing products may not seem very strong. After all, orders last year were up nearly the same.

But the big year-to-year difference is in the makeup of the orders. Last year, new auto orders, up a resounding 30 pct, accounted for a lop-sided share of the gain in total orders. But the bigger gains in motor vehicles for this recovery appear to be past. There will be more gains in autos but not likely such dramatic ones as seen last year.

This shift in emphasis from autos means the durable goods recovery will not only continue strong but will spread throughout most heavy-goods manufacturing. Many industries and companies until now largely untouched by the recovery, will feel the magic wand in 1984.

Last year, the hero of the recovery was the consumer. For example, consumer spending for durable goods in the second quarter rose by 33 pct at an annual rate over the first quarter. And that first quarter had already seen a strong gain.

The start of the move to front and center in the recovery by industrial goods manufacturers was seen in the third quarter last year. In that quarter, business fixed investment rose by an inflation-adjusted 16 pct. At the same time, personal consumption expenditures had cooled to a 3 pct annual growth rate.

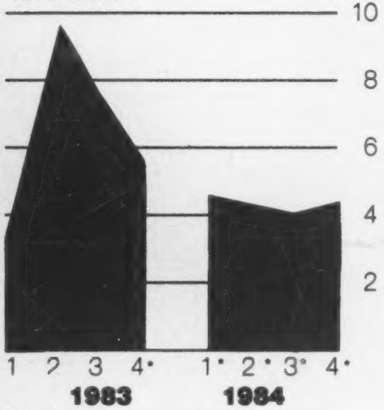
This recovery participation by manufacturered industrial goods lines is the best assurance there is that the business recovery will be a durable one. When these big-tag goods join fully in an upturn, then a recovery period usually matures rapidly into a full-fledged business expansion period.

Just about all critical business signs now point to continued recovery through 1984. The economy—measured by real GNP—grew in every quarter last year. And more growth is certainly assured for the current quarter. That's a roll. And it is the first reason to believe that short-term growth will continue strong.

Prices have cooled. That's another big plus sign pointing to further recovery. The GNP deflator—the most comprehensive measure of prices in the economy—rose by 4.2 pct last year. That followed inflation rates of 9.4 pct and 6.0 pct in 1981 and 1982, respectively. The forecast this year, as business volume growth comes on top of recent growth, is for only a slight upward move in prices. This rate should be about 4.8 pct. Manufacturered goods prices at the factory level should be very close to that following an unsustainably low 1.8 pct last year.

Prices will be held in check chiefly because the economy will be operating at below its potential for some time yet.

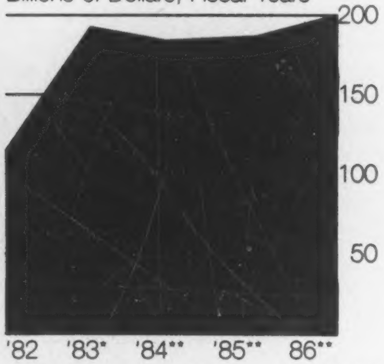
GNP
Pct Increases at Annual Rates, 1972 Dollars



*IA estimate
Source: U.S. Commerce Dept.

1983 (Full Year)	3.4 Pct
1984 (Full Year)	5.2 Pct

Federal Budget Deficits
Billions of Dollars, Fiscal Years



1972-81 Annual Ave	$39.3
1976 Old Record High	66.4

* Preliminary
** Projections—Congressional Budget Office
Source: U.S. Commerce Dept.

Another plus for 1984 recovery is in industrial production. It was up an estimated 6.5 pct last year and should come close to a 10 pct growth rate this year.

At the close of last year, industrial production had gone up 12 straight months. Too, the capacity utilization rate for all manufacturing was at 78.6 pct —up 9 pct from the year-ago level.

Inventories were being built by manufacturers as last year ended. They were expanded by a hefty $7.2 billion in the closing quarter and can be expected to rise by $8.9 billion in the current quarter.

Still, because of the very suprising strength of the economic recovery in the last three quarters last year, goods shortages are popping up all across the U.S. industry spectrum. This suggests a continued heavy orders flow as efforts are made by manufacturers to get their stocks up to par in the months ahead.

Another good 'vibe'—it is unlikely that big wage hikes will eat up much of the gains scored by business this year. A Conference Board panel of nine labor experts recently concluded, "Despite a continuing economic recovery, rising competitive pressures will hold down wage increases for virtually all employees in 1984."

The panel sees average annual earnings rising by a modest 5 pct this year.

As one of the panelists noted, "Union bargainers in 1984 are still going to proceed cautiously because of the very real threat of unemployment." The panel expects unemployment to average 8.5 pct this year, down only slightly from current levels.

The combination of high unemployment and intense competition where companies can't easily turn to price relief, puts management in a bargain-tough position.

High unemployment is also expected to give a special spur to labor productivity in 1984.

Some of the brightest news of all is happening—and will likely continue to happen—in corporate profits. These rose strongly last year, on a before-tax basis, by 21 pct. Several bank and industry economists put the rise in earnings this year at 25 pct.

As noted, most key elements of the economy will be leaping forward this year from growth already underway last year. However, one critical element will be swinging strongly from red ink to black ink in 1984. That is plant and equipment spending.

Last year, this investment declined by 4.2 pct from 1982. This year, it should be up by about 9 pct.

Capital spending picked up a lot of momentum in the last two quarters last year. At an annual rate, this spending ran some 7 pct higher than in the first half. This strong upbeat was felt by many companies in heavy-goods lines because much of it went for information technology capital goods. Example:Through the first three quarters of 1983, orders for office and computing machines were up 29 pct over the same period of 1982. Orders for metalworking machinery lines were up only 10 pct. Too, notably, these respective gains came on top of a good showing in 1982 for office and computing machines and a poor showing for metalworking machinery.

Now, with factory orders, production and profits all up, it is just about certain that plant spending should continue moving ahead—more strongly and more broadly.

So, it appears that all the instruments in the recovery band will be playing in tune together this year. Heavy goods manufacturing lines, the big tubas, are now starting to join in strongly.

Conference Board chief economist Albert T. Sommers has summed up the 1984 outlook succinctly.

"We see no local explosions and no virtuoso performances in any sector of the economy next year," he says. "Instead, we expect a broadly distributed expansion, as distinguished from the powerful but not fully coordinated recovery of 1983."

The 12 economic authorities who make up the Conference Board's annual Economic Forum cite "declining inflationary pressures" as the key reason for their forecast of solid growth (5.4 pct) this year. They note "stable energy prices, a further dip in unit labor costs, rising productivity and the deflationary impact of a high-priced U.S. dollar."

Altogether, the economic scene as 1984 opens is a bright and hopeful one. Business is on the move, expanding strongly, and the expansion is spreading rapidly across all spectrums of the economy.

Too, economic expansion is now occurring in the rest of the industrial world. This means the U.S. economy will not be tethered to a dragging world economy in 1984.

The Gross Domestic Product (GNP less foreign sales) of the 10 nations of the European Communities (EC) is forecast by the EC to rise by 1.5 pct. That is not up to the strength level of the U.S. recovery, but it is a lot better than the paltry 0.5 pct rise scored by the EC last year.

As noted, the 'plusses' run big for this year.

But there are those who see, for sometime next year—and a few who see for later this year—a brick wall looming across the recovery raceway. Depending on who the worrier is, that brick wall is made up of the staggering Federal budget deficit, a likely tight money policy by the Fed as prices start to edge up, the record-shattering U.S. trade deficit or the default-threatening debt load of Less Developed Countries (LDCs).

It is true that any of these so-called 'time bombs' could explode and derail the recovery. It's also true, of course, they might be de-fused through evolving strength in the economy or through effective policy solutions.

The greatest concern centers on the high and scary Federal budget deficits. The fear is that a credit crunch could develop as government borrowing to finance this deficit—now gobbling up about 50 pct of the nation's credit supply—runs smack into stepped-up business borrowing as the economy expands further. Such a collision could lead to high recovery-threatening interest rates.

The Fed is a great source of worry to many economists and business executives. The recessions of 1981 and 1982 attest largely to the power of the Fed to rein in the economy. If the Fed peers through a steaming-up economy and sees the spectre of killer inflation lurking on the horizon, then it could be expected to again turn to its favored weapon of tight money supply.

Almost certainly then, interest rates would climb—and climb.

The U.S. trade deficit has soared in recent years. It's cost to U.S. manufacturing is clear enough to both management and labor. As noted in the chart here, the trade deficit has gone from $28 billion as recently as 1981 to an estimated $75 billion last year. And U.S. Commerce Dept. officials are now talking of strong chances for a $90-100 billion red-ink bath this year.

As one economist noted, "Somewhere there is a point where this kind of imbalance could untrack our economic recovery. A lot of money is flowing overseas and so are a lot of orders that might otherwise go to U.S. industry."

In the case of concern over the LDC's debt problem, the worry centers on possible default by one or more of these debtor nations. There seems at present, no way a number of these back-to-the-wall countries can pay off even current and over-due interest costs let alone principal repayment.

The fear is that if any of these countries throw in the default towel, it is possible that panic would grip international financial circles. What this could lead to is impossible to know. But, for sure, any effect on the U.S. economy would not be favorable.

All these threats to continued recovery cast a dark shadow across the U.S. economy even as high interest rates show a persistent staying power. This is especially true for long-term rates. For example, 30-year Treasury bonds (mid-December), ran at a 11.8 pct rate. That's actually up from a year-ago rate of 10.6 pct.

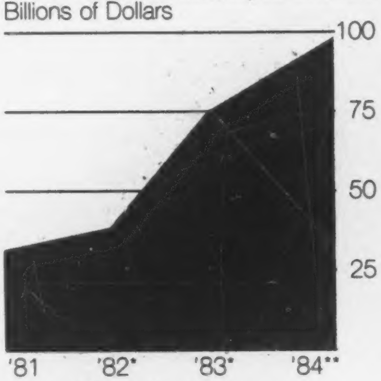
At the same time, average Aaa industrial bond yields were running at 12 pct versus a low earlier in the year of 10.7 pct.

Significantly, it is long-term credit that is a prime feeder of plant and equipment spending. And if the money can't be found at reasonable rates to finance capital investment needs, then it is hard to imagine a durable recovery taking place.

But, in sum, the facts of the present on the U.S. economic recovery seem to far outweigh the fears of the future. This is especially true for the year 1984.

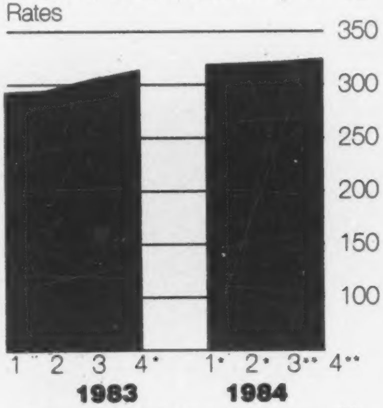
The piper may be waiting, but he doesn't appear to be hiding behind any of the calendar pages of 1984. ☐

U.S. Trade Deficits, in Goods
Billions of Dollars



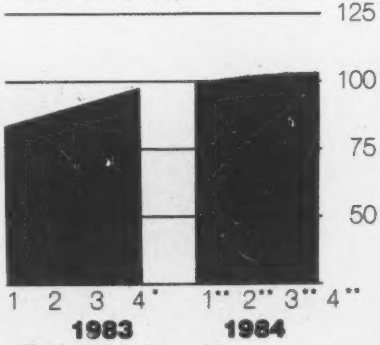
* Est. based on 10-mos. data
** Forecast—IA
Source: U.S. Commerce Dept.

Plant Spending
Billions of Dollars, Seas. Adj. Annual Rates



*Based on business survey, Oct.-Nov. '83
**IA Forecast
Source: U.S. Commerce Dept.

New Orders, Durable Goods
Billions of Dollars, Mo. Aves.



*Est. based on 1-mo. data
**IA estimate
Source: U.S. Commerce Dept.

STEEL

Steel shipments are expected to go from about 67 million tons in 1983 to about 78 million tons in 1984.

Continued improvement is expected in consumer markets and there is supposed to be a partial recovery of the capital goods sector.

If steel prices firm up, there could be a dramatic profit swing in steel. The mills have slashed their work forces and reduced all costs. With firm prices and added volume, profits could soar higher than expected.

Imports are one big source of uncertainty in the steel picture. The mills have been projecting imports of about 16 million tons for both 1983 and 1984. In the last three months reported, foreign steel was arriving at an annual rate of more than 19 million tons.

If the foreign flow continues, it could put a dent in a recovery that will be broad but modest. Machinery, construction, appliance, auto, oil and gas and all other market segments should show gains in 1984. Unless the gains exceed expectations, total demand will be well below what used to be considered normal.

An extreme example of the expected recovery is provided by the railroad industry. After falling nearly 70 pct in 1983, steel shipments to the railroads are due to rise 80 pct in 1984. These percentages might suggest a powerful upswing, but 1984 railroad steel intake will be only about one-sixth of what it was a few years ago.

In the oil and gas market, the number of drilling rigs in service is expected to rise from an average of about 2,200 in 1983 to an average of 2,700 in 1984. That will bring a 10 pct rise in steel consumption, but it won't bring back the 1981 boom. In that year, the rig count went over 4,000.

Auto sales should rise again in 1984 and with car inventories low, production should go up even more. Production should rise, that is, if the auto companies and their suppliers can move into high gear.

Going into 1984, steel producers had fallen behind in their deliveries of sheet to auto plants and others. Although steel operations were below 60 pct in most of the fourth quarter, sheet lead times were stretching out and deliveries were lagging.

The delivery situation was partly a reflection of mill caution. Having been killed by price cutting over the past two years, the mills were guarding against over-production.

In addition, the transition from a deep, devastating depression to even a partial recovery is proving difficult. In 1982, sheet production reflected auto production of only 5 million cars. In 1984, auto production will approach 8 million cars.

With manpower depleted and many facilities retired, the mills aren't finding it easy to adjust to a 60 pct jump in a key market. As the recovery broadens, the same difficulty could arise in other markets and products.

It is probably far-fetched to suggest a steel shortage in 1984, but no one really knows how much effective steel capacity is available.

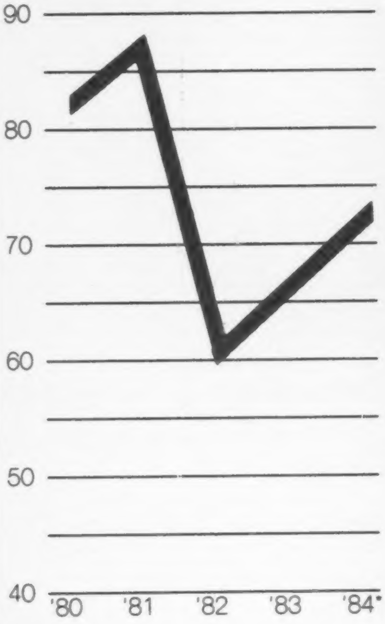
One slice of capacity was removed in 1983 when Kaiser Steel Corp. terminated steelmaking operations. The proposed merger of Republic Steel Corp. into LTV Corp. will bring further contraction and consolidation. More steel mergers are predicted.

As of mid-December, everyone was waiting for United States Steel Corp. to reveal its consolidation plan. Almost all of U. S. Steel's production centers were mentioned in speculations on facility cuts.

There is uncertainty about steel capacity, but the steel market outlook is equally uncertain. It's reasonable to assume that any surprises in the steel market situation should be on the upside. The projected 1984 shipments are incredibly low for the second year of a recovery.

It is probably far-fetched to suggest a steel shortage in 1984, but no one really knows how much effective steel capacity is available.

Steel Shipments
Millions of Tons



Source: AISI *IA estimate

NONFERROUS

The business recovery of 1983 was kinder to aluminum than it was to copper, lead and zinc. It wasn't kind to nickel or molybdenum at all.

The difference was on the label. It was a consumer-led recovery and benefitted mainly commodities and products serving that particular market. This shoved aluminum shipments back on the track (particularly with domestic car and truck production up about 32 pct and 25 pct respectively) and it also helped copper, zinc and lead consumption to lesser degrees.

What copper needed to complete the picture—and nickel and molybdenum needed even more—was a revival in the industrial sector itself. Capital spending was down about 3.5 pct last year, on an inflation-adjusted basis, and that was from 5.5 pct drop in real capital spending the year before. There was a surge in capital spending in the latter months of 1983 and government economists have forecast a further, albeit slower, rate of gain in the first half of 1984.

Domestic copper producers treaded water last year as far as prices and production were concerned. Increased shipments didn't help either case. The hedge market inventory ruled in the price area and there wasn't any room for higher domestic production. U.S. producers weren't exactly overburdened with inventory as the new year began, which means they still are poised for fast recovery once the capital goods market beckons.

Copper users worked from conservatively-held inventories all year, a policy that today seems to cover a broad range of production materials.

Aluminum production here and abroad picked up smartly in the final quarter of 1983, reflecting increased shipments (which were expected to show a gain of at least 14 pct for the year) and a steady whittling down of domestic producers' stocks. Aluminum industry observers foresee a gain of 10 pct in shipments this year, which would put the industry over its record of 7.43 million tons in 1979.

Price recovery in aluminum was most evident in ingot, but the U.S. producers were beginning to improve their markups on flat rolled items, including common alloy sheet, as the year drew to a close. Rigid container sheet remained a strong market—and a crowded one with new capacity coming onstream and Japanese material still coming into the U.S. market despite higher Japanese raw material costs.

The aluminum companies had just about sewed up the beer and beverage can market, leaving further growth in this end of the business awaiting the success of their planned invasion of steel's food can market.

Zinc consumption improved last year with increased car production and the apparent success of the zinc penny—a market won in large part by expectations that copper prices were heading for the roof. Domestic zinc production was up a bit, but imports continued to claim the biggest share of the U.S. market.

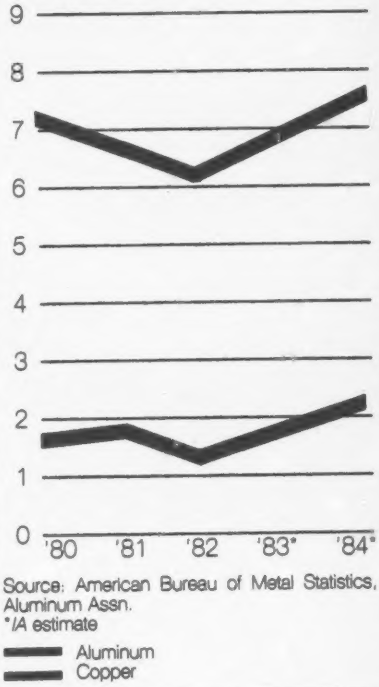
Lead prices and production were static almost all the way through 1983. Russian buying on west European markets was down sharply from earlier in the 1980s.

Severe weather conditions over many parts of the U.S., even before winter began officially, promised to supply something the lead smelters have been seeking for three years: a coup de grace to all those automobile storage batteries that have been nursed too long by too many clement winters.

Nickel producers are looking for a 9 pct gain in non-communist world nickel consumption next year and fighting to hold the share taken by Russo-Cuban material to a minimum. Consumption last year was up about 12.8 pct to the widely forecast 1.1 billion lbs. and the 1984 projection would raise this to 1.2 billion lbs.

Aluminum industry observers foresee a gain of 10 pct in shipments this year, which would put the industry over its record. . . .

Nonferrous Metals, Shipments
Millions of Short Tons



Source: American Bureau of Metal Statistics, Aluminum Assn.
*IA estimate

AUTOMOTIVE

Americans in 1984 likely will buy 7.9 million cars built by domestic automakers—an increase of 1 million units over the 6.9 million sold in 1983. Sales of imported cars likely will rise from 2.3 million units in 1983 to 2.5 million in 1984.

The Big 3 will make big profits in 1983 and bigger profits in 1984.

Renault executives expect American Motors to make a small profit in 1984.

Volkswagen of America became profitable this year and should continue that next year. This is due more to the healthy sales of the Porsche and Audi models than Volkswagen's own models.

Automakers raised car prices by about 2 pct for the 1984 model year and likely will raise prices 2 or 3 pct in the fall of 1984 for the 1985 model year.

"Prices will continue to inch up while the economy remains fragile," said the sales analyst for one automaker. "In 1984, the price of the $6,000 small cars likely will rise by about $100, or 1.5 pct, and the price of the $10,000 large cars by $500, or 5 pct."

Car prices in 1983 rose by 3 pct, but the average transaction rose by 7 pct. That's because customers are buying more options—and more expensive options, such as cruise control and electronic displays.

"The move toward larger and more expensive cars," said another auto analyst, "will continue as buyers' income expectations improve with the economic recovery."

As large cars continue their fast sales rates, dealers' inventories of them will continue to be low. 1983 ended with dealer inventories of 1.3 million cars, a 57-day supply; automakers consider a 60-day supply just right.

Many of the plants building large cars already are running at capacity. Many autoworkers are working overtime. By spring of 1984, General Motors will have called back 90,000 employees to work since January 1983.

The present labor contracts at General Motors and Ford expire Sept. 14, 1984. The UAW will ask for more callbacks of workers and less overtime.

A host of good signs favor sales of 7.9 million U.S. cars in 1984: lower interest rates, lower unemployment, higher disposable income, new models, stable gas prices and an improving economy. A dramatic jump in the prime, say automakers, could kill the upturn in car sales.

Automakers disagree how long the upturn in sales will last. One Big 3 chairman, a perennial optimist, said the economy has entered a "robust recovery. We could have an expanding economy for the next five years if Congress and the (Reagan) Administration trim the national debt and keep interest rates down."

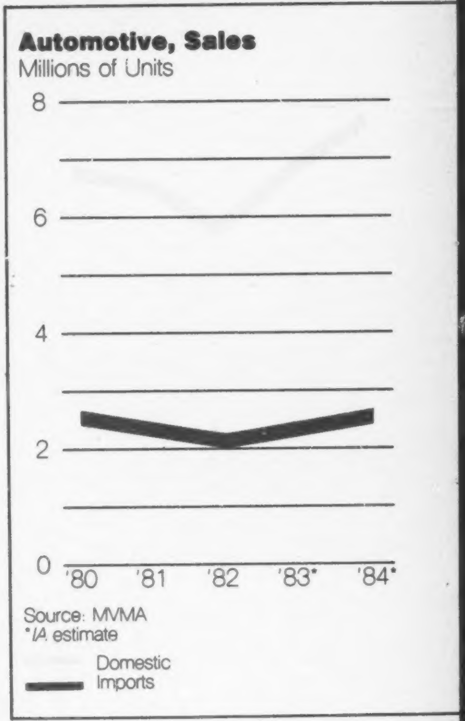
The analyst at another Big 3 automaker is much less sanguine. "The last recovery in auto sales," he said, "began from the low point in sales in 1974 and continued through 1979. Then sales dropped like a rock until we hit bottom in the fourth quarter of 1981. Since then sales have improved.

"I expect the present upturn, like the last upturn, to last four or five years—from the fourth quarter of 1981 until 1985 or 1986. Then sales will drop off again. However, they won't drop off as much as they did in 1980-82, because the rise in sales in 1983-85 won't be as great as in 1977-78.

"The present rebound doesn't have the buoyancy that the recovery of 1977-78 did. We're coming off such a low level of sales from 1982."

The analyst predicted that sales in 1985 will be ±4 pct above or below sales in 1984. Other analysts agree that total sales in 1985 probably won't exceed those in 1984 by more than 5 pct, or 500,000 vehicles. If total sales in 1984 reach 10.4 million, sales in 1985 could reach 10.9 million.

'I expect the present upturn, like the last upturn, to last four or five years—from the fourth quarter of 1981 until 1985 or 1986.'

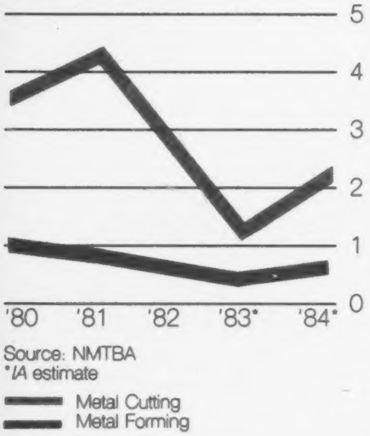

Automotive, Sales
Millions of Units

Source: MVMA
*IA estimate

MACHINE TOOLS, FLUID POWER

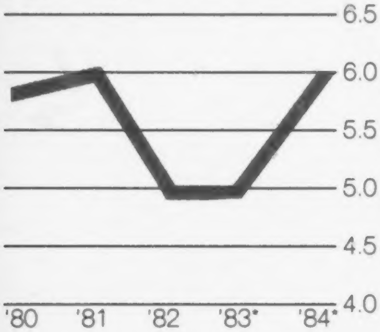
The industry worldwide expects the capital goods surge to begin in 1984. . . .

Machine Tools, Net New Orders
Billions of Dollars



Source: NMTBA
*IA estimate

Fluid Power, Shipments
Billions of Dollars



Source: Dept. of Commerce and NFPA
*IA estimate

MACHINE TOOLS—Industry members are waiting for good news, but some experts believe they may remain waiting for perhaps half or more of 1984.

"It's always the last industry to recover," said an analyst.

Some leading industry executives have all but written off the first half of 1984. "We don't expect a significant increase in sales until very late in 1984, but the way the economy is shaping up now we could be proven wonderfully wrong," said one source.

"They may see their return to economic health early in 1985," said an economist.

Many are concerned with another issue that may change everything. That issue will be decided, one way or another in March. That's when President Reagan must either accept or reject the Department of Commerce's recommendation on the machine tool industry's Section 232 petition on imports.

The industry worldwide expects the capital goods surge to begin in 1984 and sees machine tools playing a key role in that rebound.

In the larger FMS (Flexible Manufacturing Systems) area, several U.S. tool builders in that market believe they can more than hold their own against foreign producers from Europe as well as Japan. And, if the automotive world tilts toward FMS, that business would become tremendous.

Other machine tool companies, makers of stand-alone machines, for example, are more than worried. "We cannot compete on price with Japan," said one. "Without Federal import quotas, we will not remain in the business."

Not all producers are so negative. Said one: "When business gets better, it will get better for all of us. All this talk about the end of the world if we don't get 232 is nonsense. Some of us will survive. We have so far. Some won't. But the machine tool industry is here to stay, in one form or another," he added.

FLUID POWER—The industry expects a strong 20 pct gain in 1984. Despite relatively conservative forecasts from some key markets, executives in both the hydraulics and pneumatics markets are feeling a lot better about 1984 than they did at the beginning of 1983.

A swing of that magnitude isn't that surprising to fluid power historians, who point out that the industry in the past has gone through two year lulls, but then snaps back sharply enough that it has a 15 pct growth rate average for the full decade.

One big producer argues that a 20 pct forecast for fluid power is too low and said gains would more nearly approach 28 to 30 pct.

Pneumatic orders have been more stable in the past year than hydraulic, but both slipped sharply, and both were beginning to show signs of a recovery as early as last May. This has continued, and hydraulic orders by September were able to show a 72 pct gain over the year ago period.

Manufacturing rates for fluid power makers rose in some plants during the first half of 1983. At year-end, production increases were continuing as the industry planned for a good year-long upswing in 1984, beyond the seasonal gains it usually sees in the first and second quarters of each year. Since the normal sales peak in any year comes in the second quarter and most manufacturers reduced inventory during the first part of 1983 and all of 1982, the manufacturing rate has to swing back a little more than the sales rate for producers who are anxious to keep deliveries fast and to retain market share.

At a proposed $6 billion 1984 sales level, and that's conservative, the industry would be matching its best past dollar year. With the cost cutting programs that were inaugurated during 1981 and 1982 and continued in 1983, the industry should show a better net gain than the 20 pct sales forecast would suggest.

COMPUTERS, INSTRUMENTS & CONTROLS

COMPUTERS—The continuing growth of the economy is one reason why computer shipments will increase this year.

However, even if the economy slumped in 1984, computer sales would remain strong. The desire for computer equipment seems to be immune to recessions.

During 1983, computer shipments totalled $41 billion, about 15 pct above the 1982 figure of $35.7 billion. Experts at the Department of Commerce believe this industry will grow 18 pct through 1984. Total shipments for 1984 are projected at $48 billion.

Although many types of equipment sold well in 1983, the item attracting the most interest was the personal computer designed for business use. In 1984, interest in computers by businessmen should continue to grow. And with the introduction of the PCjr by IBM in early 1984, some of that interest should carry over into the home market.

Computer sales in 1984 also will be helped by growing demands from overseas. Export markets have been in the doldrums for some time. In 1982, exports rose only 5 pct. In 1983, that figure was 15 pct. Before the worldwide recession, export totals increased at rates approaching 40 pct a year. Export sales in 1984 will creep above 20 pct, although the European market will begin to show some slow improvement in market performance.

In addition, foreign companies are beginning to take advantage of the immense U.S. craving for computers and computer equipment. "Nineteen eighty-two was the first erosion of the U.S. trade surplus in computer equipment," reported a U.S. government official. "This erosion has been due primarily to the Japanese, but has been helped along by U.S. firms turning to overseas manufacturers. To remain price competitive, American companies are farming out their manufacturing operations to overseas firms."

INSTRUMENTS—Makers of instruments and controls were buoyed only slightly by the upswing of the economy in 1983. All told, the industry only grew by several percentage points during the year. Figures for 1984 are expected to be slightly better. Forecasters see an increase of industry shipments in 1984 of under 6 pct in current dollars.

The industry should grow slowly in 1984 because spending for capital goods (other than computer equipment) will remain sluggish. High interest rates will continue to discourage investment in plant equipment. Manufacturers of process controls and industrial controls had a bad year in 1983 and the best thing about the first quarter of 1984 probably will be that business will not be declining. Business should pick up gradually throughout 1984 as old markets begin to come back.

As the economy gathers steam in 1984, capital spending will increase by about 5 pct. The instrument and controls industry will experience a corresponding pickup.

Capital spending has lagged behind recent recovery efforts. High interest rates and the severity of the recent recession are blamed for this slow pace in plant and equipment investment by the manufacturing community.

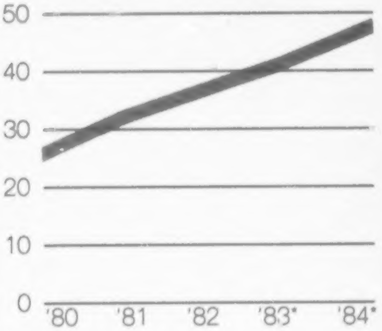
Another reason for the expected slow growth in 1984 is the continuing slump of overseas markets. Instrument manufacturers ship nearly 30 pct of their products out of the U.S. Third World nations, like the Arab countries, have been purchasing few controls for their industries.

Experts see sluggish growth in European markets in 1984, further slowing sales growth for the instrument makers.

Not all segments of the industry are depressed. Instruments that are destined for the electronics industry are in high demand now and will be in even greater demand in 1984 as the semiconductor and computer industry improves on its impressive 1983 showing.

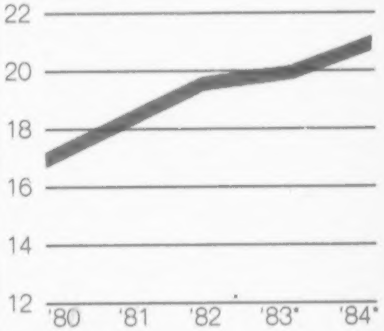
. . . even if the economy, slumped in 1984, computer sales would remain strong.

Computers, Shipments
Millions of Dollars



Source: Dept. of Commerce
*IA estimate

Instruments & Controls, Shipments
Billions of Dollars

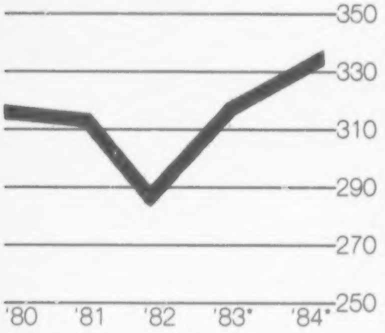


Source: Dept. of Commerce
*IA estimate

INDUSTRIAL COATINGS, PLASTICS

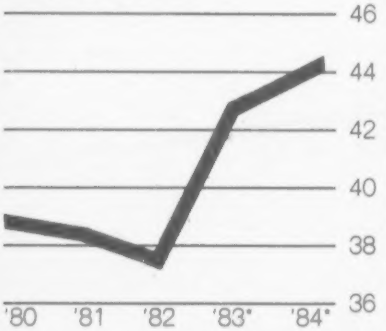
'The big growth in coil coatings will be in the appliance industry.'

Industrial Coatings, Shipments
Millions of Gallons



Source: Dept. of Commerce
*IA estimate

Plastic Resins, Sales & Captive Use
Billions of Lbs



Source: SPI Committee on Resin Statistics, compiled by Ernst & Whinney
*IA estimate

INDUSTRIAL COATINGS—Shipments of industrial coatings to original equipment manufacturers (OEMs) likely will increase from about 320 million gallons in 1983 to 335 million gallons in 1984. That 5 pct increase in shipments doubles the traditional 2 pct annual growth of the product-coatings industry.

The upturn in the automotive and construction industries will account for many of the additional gallons shipped. Shipments to the big industrial-maintenance market should grow by 8 pct; and to the big packaging and medium-size marine markets by 3 or 4 pct. Shipments of coatings to makers of aluminum extrusions, office equipment, and business machines, which are smaller markets, should grow by wider margins: 10 to 15 pct.

Appliances are another big market. Here the coil-coating industry is scoring major gains.

"The big growth in coil coatings," said the vice president of one broad-based Midwestern coatings company, "will be in the appliance industry. 1984 probably will be the gear-up year leading to major growth in 1985-6. I expect shipments of coil coatings to appliance makers to increase by 10 pct in 1984 and by a lot more in 1985-6."

Coil coatings account for 10 to 15 pct of the total industrial-coatings industry. (If customers don't buy precoated materials, they dip or spray their products with coatings in their own plants.)

Companies are using more sophisticated coatings to maintain their facilities, said another vice president: "They're moving away from the alkyds and the vinyls and toward epoxies and urethanes."

The packaging industry is moving rapidly away from oil-solvent to water-reducible coatings. "Ninety pct of the coatings on beverage cans," said the vice president, "are water-reduxible. Food cans are starting to go that way too."

PLASTICS—This past year was a banner year for plastics. As other industries stumbled along, plastics shot up by 15.6 pct in production over 1982 and by 15 pct in sales and captive use.

"One of the great things we have to talk about," said a leading spokesman for The Society of the Plastics Industry, Inc. (SPI), New York, "is the fact that the increases for 1983 totals will exceed that 14 pct prediction which seemed so implausible when it was made 12 months ago."

The final estimates for the plastics industry were based on data received by SPI through September of last year and projected through the end of the year.

The biggest increase among the more popular plastics was registered by polypropylene. Known as one of the more active competitors of metals, polypropylene's production increased by 26.5 pct over 1982 or a total of 4.4 billion lbs. Sales and captive use were also at 4.4 billion lbs, up 21.4 pct from 1982.

Epoxy resins, another plastic used in the manufacturing industry, increased in sales and captive use by only 3.4 pct, although production rose 11.5 pct.

A strong year was recorded by phenolic and other tar acid resins, with a 22.8 pct increase in sales and captive use and a 24.1 pct jump in production.

How about 1984? The SPI is forecasting a 45.1 billion lb year for plastics resins, or an increase of 6.7 pct over 1983.

The growth in the use of polypropylene is expected to settle down to a level of a more realistic rate of growth this year. Its growth is projected at 8 pct. ABS and other styrenics are expected to increase to 7 pct, going to 1.2 billion lbs. In the thermosets, polyesters are projected to post an increase of 10.5 pct with the further expected recovery in autos, boats, construction, appliances and additional consumer goods expected.

CONSTRUCTION, FARM EQUIPMENT

CONSTRUCTION EQUIPMENT—Buoyed by steady gains in its lighter equipment lines, construction equipment makers are now looking for substantial gains in 1984.

The 1984 forecast figure of $4.8 billion (which represents a selected part of the total market) is up about 15 pct.

This is conservative by many standards. A number of companies are talking of dollar gains of 20 pct in 1984, and a forecast by the Construction Industry Manufacturers Assn. (CIMA) members points to about a 22 pct gain in the numbers of units that will be marketed during 1984.

There's no doubt that 1984 is beginning with significant improvement. Highway equipment was beginning to move up in the first quarter of 1983, as *Iron Age* pointed out in its quarterly forecast at that time. Since then, as one source pointed out, "It's been almost a steady gain—even if it was at a slow rate—for most of the year."

The problem was that unit sales numbers were advancing at a better rate than dollar sales were climbing. The price disasters of latter 1982 didn't straighten themselves out in 1983. Sacrifice sales, especially of a lot of heavy equipment that packs big dollars in its list prices, were almost a universal rule right through 1983. The price slashes were deep, and deep enough to offset any possible gains in dollar volume and an increase in sales performance.

The sales had one important effect. They cleaned out a lot of inventory that was a millstone around distributor-dealer necks.

One good sign about 1984 is that dealer prices began firming in the fourth quarter of 1983. This indicates that the dealer inventory problem has been whipped into better shape.

This year will start at a good pace, probably peak in the second quarter and then manufacturing rates will drop seasonally in the second half.

FARM EQUIPMENT—Tractor sales could post a 15 pct gain in 1984.

Farm machinery sales gains have been mainly in light equipment and some producers of pull-behind tillage or forage equipment were reporting sales gains in the first half of 1983. But that's not enough to push this big industry out of the trough it's been in for the past two years.

Through the first nine months of 1983, combines were off 11 pct, forage harvesters off 17 pct, and some other forage equipment was off as much as 24.5 pct.

Like the construction machinery industry, farm equipment makers have been plagued by a slow export market and a continuing influx of foreign built machinery. This condition, along with continuing heavy stocks of the big ticket machines has confined the forecast for a 1984 gain pretty much to the light equipment machinery lines. So it doesn't give the farm machine builder a chance to step up his cash flow as much as a 15 pct tractor unit gain might suggest.

Reports in late November suggested that even some pessimists were surprised at the amount of new sales they were getting at the last minute, but weren't impressed enough to begin changing their plans for 1984.

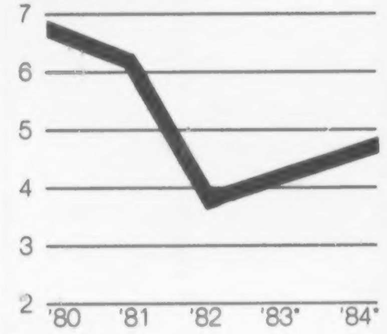
The best news in months came when Deere & Co., the biggest U.S. producer, announced a $58 million net return in the fourth quarter that offset earlier losses and produced a gain of $23.3 million for the fiscal year ending last September.

The problem: Deere's gain came in its industrial equipment sales, while farm equipment operations were cut back 23 pct to reduce field inventories. Sales declined in farm equipment by 18 pct for the year.

Deere has indicated that, even with the production cuts of 1983, it will have to continue to cut back production during 1984.

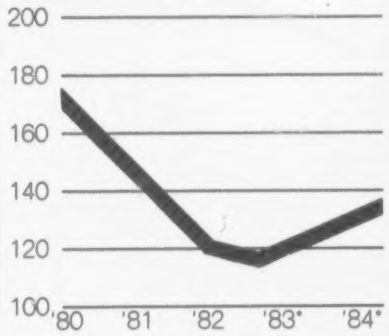
. . . dealer prices began firming in the fourth quarter of 1983.

Construction Equipment, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Farm Equipment, Wheeled Tractor Sales
Thousands of Units



Source: Farm & Industrial Equipment Institute
*IA estimate

OIL COUNTRY, MINING EQUIPMENT

OIL COUNTRY—The tubular goods industry is beginning to see signs of a pickup, but the recovery in the industry is expected to be a cautious one through 1984.

Steadily improving oil and gas drilling activity throughout 1983 helped spur an increase in domestic oil country tubular goods (OCTG) business. A similar slow but steady improvement is foreseen for 1984, especially in drilling of shallow oil wells. But the industry is not yet poised for the upsurge it needs to match the bullish figures of the late 1970s and early 1980s.

Industry executives are keeping their fingers crossed that the national economic recovery continues through the year and that crude oil prices stabilize or increase. That would help spur drilling activity.

Drill utilization rates crept up throughout most of 1983. By December there were 2,704 rigs in operation after a low of 1,807 in April. The average for 1983 was expected to be 2,027. Projections for 1984 called for an average increase of about 6.1 pct, still below the rig levels of 1982 when an average of 3,105 were operating.

The number of oil wells being drilled is expected to approach 67,000 in 1984, up slightly from 1983's figure of 63,700. However, if the trend continues throughout the year it could begin to eat into existing inventories.

One hopeful sign for the industry is that major oil companies were reporting improved cash flow positions—some by as much as 10 to 12 pct—by the end of the year. As a result, drilling budgets for most are expected to increase in 1984.

But what the OCTG industry really needs to boost production rates is a dramatic increase in natural gas drilling. Nevertheless, few experts envision that happening in 1984. "Market forces are in control there and we don't see any dramatic improvement in 1984," one industry executive lamented.

MINING EQUIPMENT—Mining equipment manufacturers are trying to forget 1983. It was one of the worst years in the history of the industry and left some companies in the business practically moribund.

As one senior mining executive said, "I'm retiring at the end of 1984 and I don't know whether they'll replace me or not." This is a fairly typical statement.

There have been some rather spectacular new products introduced recently in the coal mining industry, and when the "times seem right," it can be expected that those introducing such equipment will be the suppliers. The question is, as it has been for several years, will the "times be right" in 1984?

No company polled by *Iron Age* predicted a 1984 worse than 1983. Few, however, suggested a restoration of King Coal. "All the facts imply a restoration," said one industry observer.

The coal mining industry remains, however, a doubt-filled collection of companies.

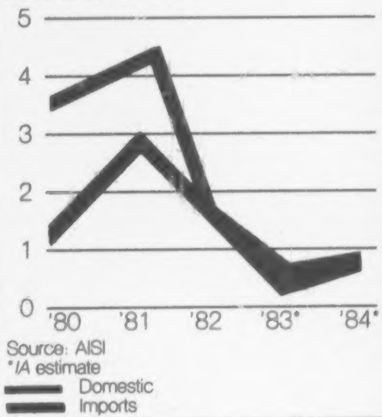
Such doubt has turned an industry that is normally concerned with long-range planning into an industry that now thinks quarterly. "Until there is some kind of consensus in the country about the good sense of clean coal, you won't see a major across-the-board modernization program in the industry," said one industry source.

Such an analysis leaves equipment makers less than thrilled about 1984. "I see the year as better, quite a bit better, than 1983, but by perhaps only 15 pct in terms of our sales," said one supplier. A 15 pct increase in that industry is a 15 pct increase above disaster.

"Our position about '84," said a supplier of iron ore mining equipment, "is that steel production will climb perhaps dramatically, but expenditures for new mining equipment will not, except for maintenance and replacement items."

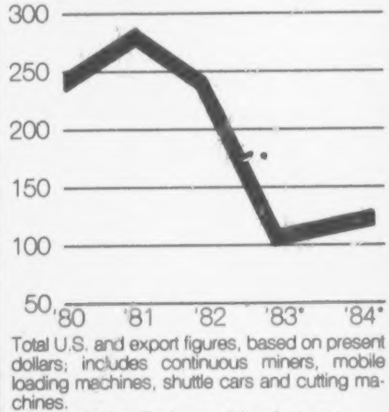
The OCTG industry really needs . . . a dramatic increase in natural gas drilling.

Tubular Goods, Shipments
Millions of Net Tons



Source: AISI
*IA estimate

Mining Equipment, Sales
Millions of Dollars

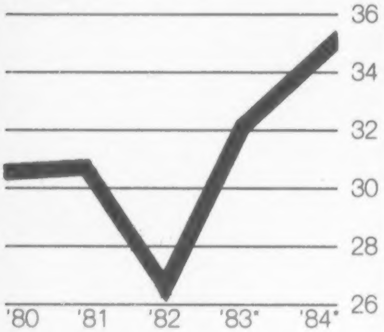


Total U.S. and export figures, based on present dollars; includes continuous miners, mobile loading machines, shuttle cars and cutting machines.
Source: Mining Equipment Manufacturers
*IA estimate

APPLIANCES, MATERIAL HANDLING

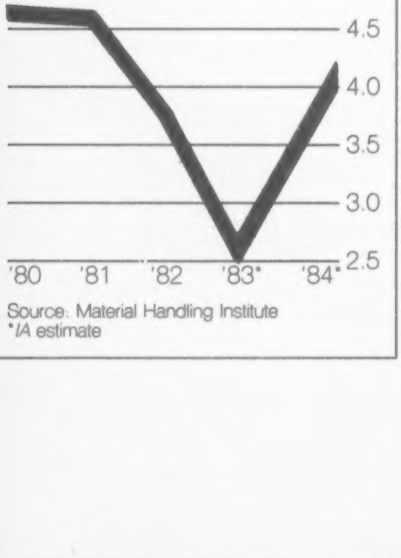
The appliance industry rode the coattails of the housing boom through 1983.

Appliances, Shipments
Millions of Units



Source: Association of Home Appliance Manufacturers
*IA estimate

Material Handling, Shipments,
Billions of Dollars



Source: Material Handling Institute
*IA estimate

APPLIANCES—The appliance industry experienced a strong 1983 and that strength could continue through most of 1984.

Sales of the nine major appliances (room air conditioners, dehumidifiers, dishwashers, disposers, compactors, refrigerator/freezers, electric ranges, microwave ovens, and laundry appliances) topped 31 million units last year, an increase of about 18 pct over 1982 figures of 26.7 million.

Growth through 1984 will remain robust, with shipments reaching 35 million. The 1984 figure represents a 12 pct increase over 1983 totals.

The appliance industry rode the coat tails of the housing boom through 1983. Growth of that market will slow down in 1984, but a moderate slowing from a good 1983 means shipments will level off a bit at high levels.

In 1983, housing completions rose some 40 pct above 1982 levels. Completions in 1984 are expected to grow 20 pct over 1983. Reportedly, three major appliances go into each new housing unit.

Added to the growth in housing market has been recent substantial increases in consumer spending. Consumers, with a growing confidence in the economy, have been spending more money. In addition, real disposable income in recent months has increased faster than at any other time in the past two years.

Another reason that more appliances will be sold this year, say several appliance manufacturers, is the average age of the current stock of appliances in the nation's homes. A large number of appliances were purchased by consumers 10, 11 or 12 years ago. On average, major appliances in the home market are replaced after 12 to 15 years.

"From 1962 to 1973, 288 million appliances were shipped. These products are now 10 to 20 years old and are ripe for replacement," said one industry spokesman.

MATERIAL HANDLING—"We think it's breaking loose now, and as this year moves along, we expect a continuing increase in orders," said a major material handling company president.

Others reported that inquiry levels for their products have been increasing steadily since the end of 1983's third quarter and that inquiries cover the entire spectrum of material handling equipment and accessories.

"For a while there in 1982 and early 1983," said an industrial truck specialist, "I thought we were never going to come back to normal. Now, I can see it developing into something sizeable by mid-year."

Most material handling companies expect to participate in any capital goods surge.

Such a surge would come on top of already moderate demand for large consumer-oriented warehousing for the food, beverage and automotive industries. " I would expect that in the larger systems area you'll see some capacity problems. These large systems are always custom and always lengthy in terms of specs. You don't automate a warehouse off-the-shelf," explained a leading manufacturer.

While one end of the business may find joy in capacity limits late in the year, another end is finding perennial misery from imports. Industrial truck manufacturers have been getting used to Japan. "They can come on strong," said one U.S. lift truck manufacturer, "particularly in price."

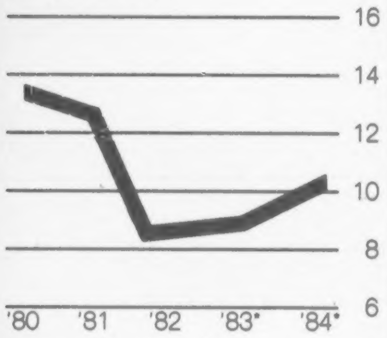
Other areas of the industry report good signs. Rack manufacturers reflect the hopes of large systems makers and expect 1984 to be up, particularly in the second half.

In general, companies in the industry expect 1984 to develop into the best year they've had in the last five. "I wouldn't say we see 1984 as a boom year, but it will be very good. We predict a 20 pct increase in business over 1983," said one executive.

CASTINGS, FORGINGS

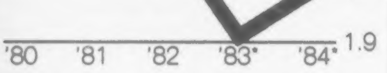
Some automotive suppliers were near capacity in the second quarter of 1983.

Ferrous Castings, Shipments
Millions of Tons



Source: Dept. of Commerce, Iron Castings Society
*IA estimate

Impression Die Forgings, Shipments
Billions of Dollars



Source: Forging Industry Assn.
*IA estimate

CASTINGS—The foundry industry is poised for its best year since 1981.

In that year, the industry shipped about 12.4 million tons of ferrous castings. It was supplying a lot of metal for equipment that had been ordered back in 1980. Like the heavy equipment industries it supplies with castings, it was living on an order backlog for domestic and export orders.

For 1984, the forecast is for a 12 pct gain over current orders. New orders, were showing a recovery at some foundries in June.

As early as first quarter of 1983, there was a pickup—if a mild one—in foundry equipment ordering as reported by the foundries. The volume wasn't enough to set the foundry equipment shops on fire, but they could see that the two-year drop in equipment orders was finally ending.

At about 10 million tons of shipments of gray iron castings, the foundry industry will be adding an improved 1984 to a solid order pickup that was widely felt during the third quarter of 1983 and was rising in the fourth quarter.

Some automotive suppliers were near capacity in the second quarter of 1983.

Auto business has remained strong, even with the reported leveling in auto sales in recent weeks. But on top of those gains in auto castings have been gains in new business coming from the capital goods sector. The best known is in trucks. Light trucks were on an upward track right from the start, and heavy trucks began to pick up in 1983 and haven't slowed down at all. They could add another 15 pct to their current level of demand during 1984.

There has also been a mild recovery in demand from construction, construction machinery, and agricultural markets. Diesel engines didn't set the consumer auto market on fire, but they are doing well in trucks and this is seen as another strong 1984 market.

FORGINGS—The forging industry had a terrible year in 1983. This year promises to be better, but not by much.

Custom impression die forging shipments for 1983 slumped to $1.9 billion, down from $2.3 billion in 1982 and 2.9 billion in 1981.

For 1984, shipments are projected to reach $2.1 billion, with orders reaching $2.0 billion.

As bad a year as 1983 was, it did have its bright spot: the automobile industry. Forging shops tied closely to the automotive market had increasing work loads, especially through the second half of the year. The trouble is in recent years automobile forgings have represented but a small part (about 6 pct) of the total impression die forging market. The smaller cars of today just do not use the amount of forgings they once did.

The forging industry's biggest market is air frames for commercial and military aircraft. Entering 1984, this market continues to sputter. Two other markets—off-highway and agricultural equipment—continue to be slow.

Some business in 1984 could come from the oil fields. "There are some early and vague signals from the pertrochemical industry which suggest that order activity will be on the increase early next year," reported an industry spokesman.

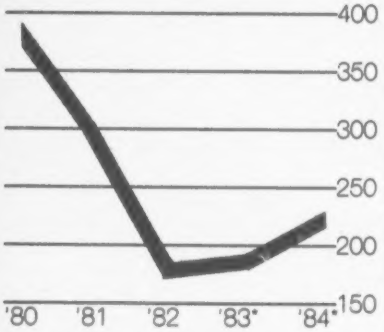
As depressing as the impression die industry was in 1983, the open die forging industry was worse. Custom open die forging shipments dropped 36 pct in 1983 to $490 million. Just two years earlier in 1981, shipments had reached $1.1 billion. Shipments for 1984 are projected to rise slightly to $520 million.

Major problems continuing into the new year include the continuing slump in aircraft production, lack of activity in the energy industries, high interest rates prohibiting capital equipment purchases, and the mounting problem of foreign forgings entering this country.

AIRCRAFT, ENGINES & TURBINES

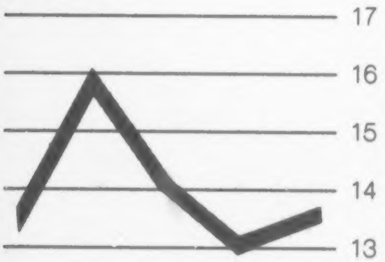
A sustained recovery (in aircraft sales) is unlikely for at least another year.

Commercial Airplane Orders
No. of Planes



Source: Airbus, Boeing, McDonnell-Douglas
*IA estimate

Engines and Turbines, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

AIRCRAFT—The airframe industry was buoyed in 1983 by increasing domestic passenger traffic and higher fares that allowed some major U.S. airline carriers to boost traffic and position themselves for the eventual ordering of new, fuel-efficient jets.

But the uncertainty of the continued freewheeling competitive fray and the glut of used aircraft cloud the airframe manufacturing picture in 1984. A sustained recovery is not anticipated for at least another year.

Orders in 1984 are likely to be up over those of 1983, a year that saw a slight improvement over the severely recessed sales figures of 1982. But the prolonged recession in the industry has taken its toll. McDonnell Douglas has backed off the civilian side of the industry, scrapping grandiose plans to develop a family of jets and concentrating solely on marketing its popular, efficient MD-80 (christened the DC-9 Super 80). Seattle-based Boeing continues to concentrate on marketing its new 757 and 767 lines and appears to be making some inroads with slowly recovering U.S. airline carriers. Only Airbus, the European-based airframe consortium, promises something new in 1984: A likely decision to move ahead on the new-technology A-320, a 150-seat aircraft aimed to fill a gap in the market expected to appear in the late 1980s and early 1990s.

Any optimism that exists in the industry is centered on the prospects for a longer-term recovery beginning in 1985 and extending into the next decade. The short-term outlook for 1984 is relatively flat.

The manufacturers are concentrating on military programs to pull them through the lean times. Profits for McDonnell Douglas and Boeing increased in the second half of 1983, thanks mainly to operating improvements in aerospace lines, government projects, higher interest income and lower interest expenses.

ENGINES & TURBINES—Conservatism still shrouds the wide-ranging engine and turbine industries. Despite signs of a slow but steady improvement that began in the latter half of 1983 and should continue into 1984. There is little expectation that the new year will bring any sort of dramatic turnaround. However, many industry officials are optimistic that the corner has been turned, the industries have reached their low point and if the economic improvement continues, the groundwork could be laid for a more dramatic and sustained recovery in later years.

Manufacturers of engines for utilities and power plants look for a reversal of the bleak statistics of the last two years when new domestic orders were virtually nonexistant.

"The next year looks kind of interesting," one industry economic analyst contended. "We foresee several new orders industry-wide, which will be an infinite improvement over the last few years. The utilities are looking out seven or nine years and they are beginning to recognize that they are going to start needing more capacity. We see a gradual upturn in orders that should lead a full recovery of the market within the next five years."

However, in the short term new domestic sales should continue to lag well behind the rapid pace of the early and mid 1970s. Most of the improvement will be felt in coal power plant construction; the nuclear end of the industry has been largely dormant.

Many industry executives questioned also contend that overseas business has been hurt by the continued strength of the U.S. dollar and by competition from financing packages arranged with the help of foreign governments in new energy projects.

There is some optimism that the end of the recession and rising consumer confidence will eat into the overcapacity that the existed in the domestic energy markets for most of 1983.

WELDING, HEAT TREATING

WELDING—The welding industry struggled through 1983 in fair shape, better than most industries in fact. One executive with a major welding manufacturer looks at 1984 with a certain amount of cautious optimism. "I would like to think that there will be a slight upturn in business toward the end of the first quarter or the beginning of the second quarter," he said.

All in all, 1983 was a marginal year. The main cause has to be attributed to the very poor year registered by the big companies. Fortunately, the smaller companies poured on some steam and picked up some of the slack. The bigger fabricators, in many instances, have been taking it on the chin.

The manufacturers of earth-moving equipment, who are traditionally the biggest users of welding, have not been fairing too well, especially overseas, and this has hurt welding production worldwide.

Welding distributors indicate that lead times are beginning to stretch out, a sign of strengthening business demand.

"Our orders are steady but still have a long way to go before they are healthy," comments one distributor.

The National Welding Supply Association (NWSA), Philadelphia, reported that September 1983 was the best month for distributor business since the boom month of October 1981. However, 1981 was the best year, certainly in terms of dollars. In terms of physical volume, 1979 was the banner year.

"Welding has not participated in the recovery," noted a spokesman for one of the major welding manufacturers, "mainly because capital goods has not responded."

As far as plate fabrication is concerned, though, one authority doesn't even see any contracts being let until the second quarter of 1984 at the earliest. "If that's the case," he added, "the welding suppliers will not hear the news until the third quarter."

HEAT TREATING—Both heat treating, and industrial heating equipment, appear to be poised for a stronger 1984. Heat treating, particularly, had mixed fortunes in 1983.

In the Midwest auto producing areas, the dramatic upturn has colored forecasts for 1984 accordingly. Some companies were up 50 to 70 pct as they approached the end of 1983.

That would make the very moderate 15 pct gain forecast appear conservative.

The East Coast, for example, held relatively better than the Midwest in the 1982 and 1981 period, when automotive was plumbing the depths back in Michigan, Ohio, Indiana and Illinois.. Some Eastern sources are a little more inclined to accept the 15 pct forecast this year.

The Sun Belt was another area that came late to the economic malaise, and is still in an earlier stage of the recovery from it. The softest spot still is the Southwest, and in particular the petrochemical and energy producing industries in that area. Even though drill rig activity has been up and inventories of some types of oil country goods have been thinned out, heat treaters are still not seeing much sign of an advance in that area.

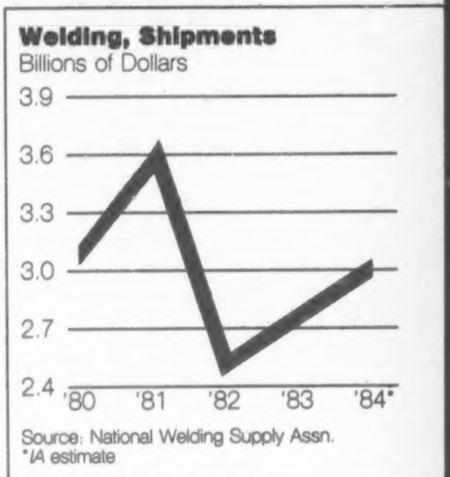
The Southeast has been somewhat more fortunate. It did take a bruising in latter 1982 and early 1983. But industry sources estimate that about midyear the area began to recover.

The Northeast, as noted earlier, held up better and is posting moderate gains.

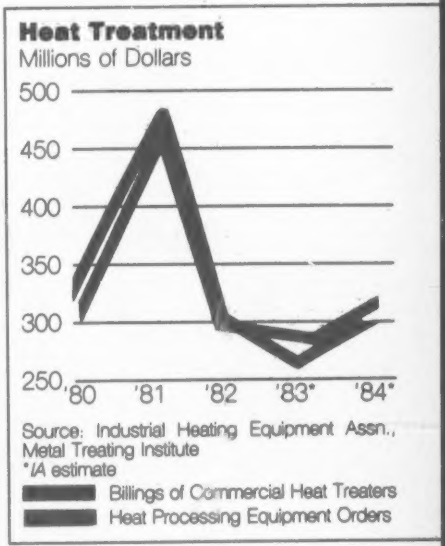
The states, in the upper Midwest, dependent on the auto market, are continuing very strong and running on a strong 1984 forecast. This appears, on a volume gain basis, to be about the strongest heat treat area in the U.S.

The West Coast, helped by defense and electronics work, has had very stable and rising performance from those two markets. It is expected to do well in 1984.

Welding distributors indicate that lead times are beginning to stretch out.



Source: National Welding Supply Assn.
*IA estimate

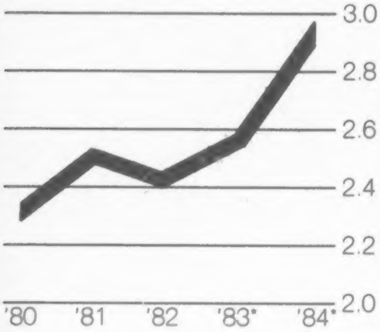


Source: Industrial Heating Equipment Assn., Metal Treating Institute
*IA estimate

SCREW MACHINE PRODUCTS, FASTENERS

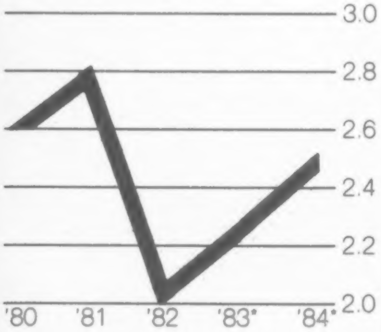
The screw machine product industry has benefitted from the upswing in auto sales.

Screw Machine Products, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Fasteners, Sales,
Billions of Dollars



Source: Industrial Fasteners Institute
*IA estimate

SCREW MACHINE PRODUCTS—The modest growth the screw machine products industry achieved in 1983 will be followed by more modest growth in 1984.

The industry, which experienced a pickup of from 8 to 11 pct in 1983 shipments should see increases in the same range in 1984. Preliminary government figures peg 1983 growth at 8 pct.

As the economy continues to expand through 1984, the screw machine products industry should expand right along with it.

The screw machine product industry has benefitted from the upswing in auto sales. Nearly one-third of screw machine products are sold to the auto industry. Another plus has been the strong showing of the appliance industry and the marked improvement of the housing market in 1983.

Another significant market for screw machine products is the aircraft industry. However, that market, which was depressed in 1983, will remain that way through 1984. The hope is that increased military business will partially offset the lack of business from commercial plane manufacturers.

Farm and off-highway equipment is another sector that remains depressed, although this market may pick up slightly later this year.

Despite the continuing high interest rates, capital equipment purchases should improve by a few percentage points in 1984. Growth in capital spending means increased sales of machinery containing screw machine products.

Entering 1984, screw machine products manufacturers see a relatively flat first quarter, followed by a strong second quarter. The cycle of growth period followed by a leveling period is expected to continue through much of the year. The biggest fear voiced by manufacturers is that deficit spending by the Federal government will depress the current period of economic growth.

FASTENERS—"The year will start out continuing to reflect the very good business we've been seeing since the midpoint of this year. What we're worried about is the way the year progresses," said one fastener industry source.

Obviously, nobody knows for certain. But if the long-awaited capital goods surge doesn't arrive in mid or late 1984, fastener makers do not expect to register a banner year.

Even with a significant increase in capital goods activity, however, the industry's overriding concern remains. Imports, particularly from Japan, are pouring in and nothing domestic companies have tried has stymied the flow.

The General Accounting Office (GAO) is investigating the way the U.S. Department of Commerce handled the fastener industry's Section 232 petition. Commerce officials recommended against it, and as a result no relief quotas were offered by President Reagan.

The GAO study could lead to any of several recommendations—from direct relief to changes in appropriate laws.

"If the GAO report is as damning as we expect it will be, we'll make mileage out of it," said an industry source.

Meanwhile, the import flood continues. While Japan is the largest exporter to the U.S. with 50 pct of the total, Taiwan second with 14 pct, and Canada third with 9.5 pct. The People's Republic of China is fourth with something around 3 pct, but growing rapidly.

So, when capital spending returns in recent years, American large bolt producers may not find a happy world returning to them.

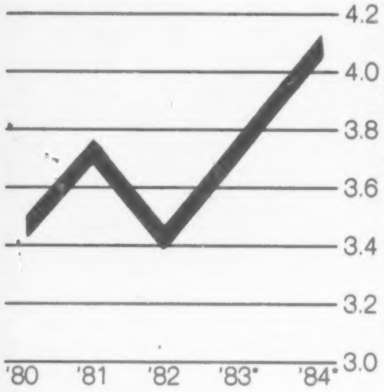
The best guesses, taking all these factors into consideration, seem to suggest an increase this year of 5 to 10 pct in dollars over 1983.

There are optimists, however, even in the fastener industry. One suggests a sweet vengeance of sorts may be in the cards if the worldwide recession turns into a worldwide boom as the decade moves ahead.

BEARINGS, STAMPINGS

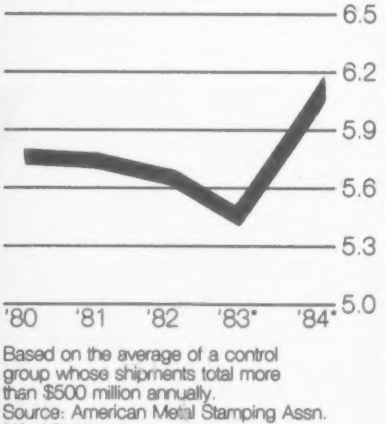
Shipments of antifriction bearings . . . should approach $4.1 billion in 1984.

Antifriction Bearings, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Stampings, Shipments
Millions of Dollars



Based on the average of a control group whose shipments total more than $500 million annually.
Source: American Metal Stamping Assn.
*IA estimate

BEARINGS—The bearings industry, which has suffered from a prolonged slump stretching through 1982 and 1983 is due for a slight upturn in 1984. "I think the industry will grow by 11 or 12 pct next year," said one industry official. Shipments in 1983 of antifriction bearings reached $3.7 billion in 1983 and should approach $4.1 billion in 1984.

The current growth of the economy has been a mixed blessing for the bearings industry. On one hand, the automotive industry is doing well, and since nearly one-third of the bearings industry supports the motor vehicle business in this sector has picked up.

Appliances have also sold well recently, helping the nearly 4 pct of the bearing industry that services refrigeration and heating.

On the other hand, some 6 pct bearing purchases come from the aircraft industry, which remains dead in the water. Other industries that rely heavily on bearings also are hardly breathing: the oil field sector, for example, as well as the farm machinery and construction machinery business. None of these sectors are supposed to set the world on fire in 1984.

This coming year, however, could signal an increase in capital equipment purchases. Since a number of bearings go into industrial machinery and machine tools, any pickup in these areas would be welcome.

Because of the continuing high interest rates, manufacturers are still cautious about capital spending. However, as plant capacity becomes increasingly utilized, manufacturers will begin making enough money to consider new expenditures. At present, most efforts are aimed at getting older equipment up and running again, equipment abandoned during the last recession. Renovating this older equipment is also benefiting bearing manufacturers, because companies need bearings to get the older equipment running again.

STAMPINGS—Indications near year-end 1983 boded well for the stamping industry in 1984. October stamping orders and shipments hit a new three-year high, reaching the highest monthly level since October 1980. Orders jumped 15 pct higher than September 1983 levels and were 55 pct above October 1982 figures.

Thus, earlier predictions that 1983 sales would be 5 to 10 pct higher than 1982 sales came closer to reality.

Still, as a whole, industry sources are guarded about sounding too optimistic and, as one put it, "the real question is how far into the first quarter of 1984 will the industry maintain high levels of activity."

One Eastern stamper says he's confident 1984 business will be at least 12 pct better than in 1983, in terms of physical volume not higher prices.

Along with the improvement in orders and shipments in October, industry backlog inched up, from September,"in stark contrast to the situation a year ago (1982) when the backlog was 29 pct lower," another stamper pointed out.

Another healthy sign: Employment in the stamping industry has been steadily rising, another indication that 1984 " may be the best in years."

Lead times, revealed another industry source, are running as good as ever, between six and eight weeks, and reports of economic recovery and consumer confidence are showing up in auto and appliance sales. In addition, companies expressed their elation about defense contracts as well as the 'solid state' of the computer field.

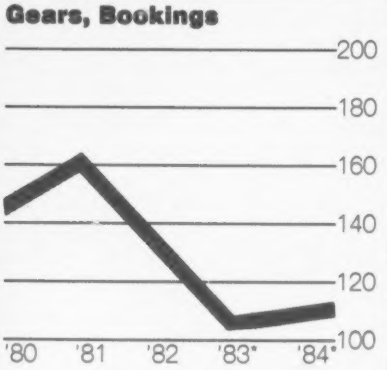
But things aren't all rosy.

A number of industry spokesmen noted the continuing supply of used machinery and its hindrance to the recovery of the captital goods

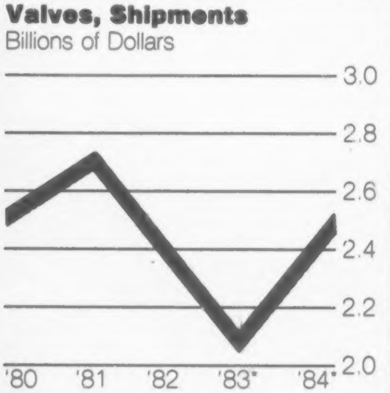
This aside, the stamping industry appears to be approaching 1984, as one source puts it, with *modified* great expectations.

GEARS, VALVES

The gear industry's salvation in 1984 will lie in smaller gearboxes.



Based on average monthly bookings, 1977=100
Source: American Gear Manufacturers Assn.
*IA estimate



Source: Valve Manufacturers Assn.
*IA estimate

GEARS—Industry spokesmen are keeping that stiff upper lip.

Last year was a major disappointment, so they're predicting a better year in 1984, with a gradual pickup in orders, but nothing spectacular.

Still, as one source told *Iron Age*, the pickup will be across-the-board, and include all product groups.

Meanwhile, 1983 orders may well be off some 30 to 40 pct from the 1982 level, and they're certainly below earlier predictions about 1983.

This industry's sales salvation in 1984 is expected to lie in smaller gearboxes, one source told *Iron Age*. But for the big jobs, "forget it," he added.

Gearmakers aren't hesitant to mention their current overcapacity and their hunger for new business.

Lead times continue to be *off-the-cuff* and, as one expert put it, "Get us the orders, we'll ship it—yesterday."

On the brighter side, December's auto sales increase of more than 21 pct is encouraging news to the gear industry, but unfortunately that is partially offset by lagging activity among the farm equipment, construction, mining and paper/pulp industries.

As far as I'm concerned," pointed out a Midwestern gearmaker who puts out a varied product line, "sales to all these markets are *on hold.*"

But not all gearmakers share his pessimism, particularly about farm equipment sales.

A number of gearmakers voiced concern about the Federal deficit, now at some $200 billion, and were unanimous that interest rates would creep up in 1984 and that the strong dollar would remain so.

But mention the word *imports* and you can count on a verbal blast—a blast aimed at the West Germans, Japan and Taiwan.

To wrap it up: Gear manufacturers are hoping against hope to get out of the blahs in 1984, but they're not putting much money on it.

VALVES—"If only the *Oil Patch* could turn into the *Cabbage Patch*," punned one valve industry source, who added that oil industry oversupply continues to depress his industry. In the last quarter, valvemakers did point out that drilling had resumed somewhat, but they have some definite reservations about the increased activity and its impact on valve orders.

Nevertheless, the valve industry is cautiously optimistic about the new year.

Part of their expectations were revealed in an industry survey that forecast total consumption of control valves and actuators would climb from $2.14 billion in 1980 to $2.79 billion by 1986, with the most dramatic acceleration in this growth getting underway in 1984.

Domestic market growth in the valve industry during this period was forecast to be an increase of some 4.5 pct each year. "Ah, don't we wish," one industry spokesman replied.

As for valve industry markets, chemical process industries should be its dominant customer in 1984 and the AWWA municipal market, which slid in 1982, has been regaining strength, and may even be showing sharp growth by the end of 1984.

Installations of digital and analog control systems, used with microprocessors or computers, will continue to punch up the order books for control valves, which could cause these units to enlarge their share of the automatic market considerably.

Meanwhile, pneumatic diaphgram-spring actuators should hold onto their market share, thanks to their high degree of reliability.

The valve industry continues to keep the wolf from the door through reconditioning and repair work.

In fact, this segment of total valve expenditures has been reported to increase as much as 11 pct per year in recent years.

RAILCARS, SHIPBUILDING

RAILCARS—When you have a situation where there are tens of thousands of railroad freight cars sitting around idle, there's not much incentive to build more of them.

Some executives are saying 1984 will be a better year mainly because things can't get any worse.

According to a statement released by the American Railway Car Institute, Chicago, in November, U.S. railroads placed 736 new and rebuilt freight cars in service in October, compared with 460 in September and 1,037 in October 1982. Deliveries in the first 10 months of the year including 100 rebuilds and 314 estimated totaled 4,512 compared with 17,070 for the same period in 1982.

Orders placed in October came to 642 compared with 416 in September and 884 in October 1982. For the first 10 months of 1983, the American Railway Car Institute stated that 4,908 cars were ordered, including 100 rebuilds, compared with 7,191 in the comparable period of 1982.

The backlog of cars on order and undelivered as of November 1, 1983, was 3,368 compared with 3,756 on October 1 and 5,597 as of November 1, 1982. Average backlog for the year as of November 1983 was 4,105 compared with 9,792 the previous year.

With all said and done, deliveries of rail cars during 1983 reached about 5,000 units. A few years ago, a year of 40,000 deliveries was considered a bad year. But, that was before deregulation (1982) and before the economy in general went into its nosedive.

Those good old years, as recently as 1980, had deliveries of 100,000 rail cars. But, some say that the 100,000 rail car year is a thing of the past.

Still, 1984 will not be all that bad. The American Railway Car Institute is predicting that there will be at least 12,000 cars delivered this year. It will certainly be a far cry from 1980, but it will be an improvement over 1983.

SHIPBUILDING—In the shipbuilding industry, they're saying that the Navy is the only game in town. The dollars are great, make no doubt about it. Congress appropriated $11.4 billion for fiscal year 1984 to get the new fleet going. But, according to one authority, only about one-third of American shipyards will benefit from the windfall.

Commercial shipbuilding is another story entirely. It has been slowly drying up for years. This coming year new construction work will continue to evaporate and ship repair will remain sluggish. There is indeed the possibility that more shipyards will close down.

Where for years the commercial shipbuilding capital of the world was Japan, the situation has begun to change. South Korea and Taiwan have begun to challenge Japan for the number one spot. According to a reliable source, Japan has 46 pct of the market although its share had been 51 pct. South Korea now has 12 pct and its share is growing.

As far as the juicy Navy contracts are concerned, Electric Boat Division of General Dynamics Corp. will have its hands full with a $1.7 billion contract for a Trident submarine and two attack submarines at $1 billion a piece. A third one will be built by Newport News Shipbuilding & Dry Dock Co.

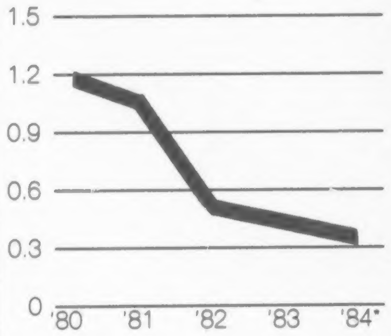
Ingalls Shipbuilding will build the $1.3 billion amphibious assault ship and several AEGIS cruisers. Avondale Shipyards has a contract to fabricate five landing ship dock vessels. Bath Iron Works and Todd Shipyards are also busy with Navy work.

Back to the commercial side, shipbuilding is in a grim state internationally. Only Japan, South Korea and Taiwan are showing any strength.

An over-supply of offshore drill rigs certainly has not helped the industry.

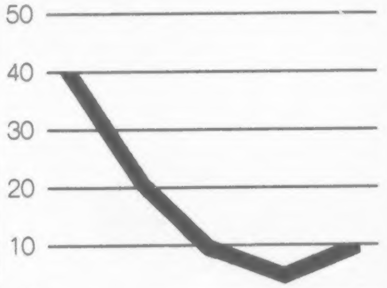
There is indeed the possibility that more shipyards will close down.

Shipbuilding
Millions of Gross Tons



Commercial ships on order or under construction on Dec. 31 of each year, 1,000 gross tons or over
Source: Maritime Administration
*IA estimate

Rail Car Orders
Thousands of Units



Source: American Railway Car Institute
*IA estimate

Reprints available while supply lasts. For single copy, circle No. 95 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4463.

METAL PRICES & PRODUCTION DECEMBER 31,1983

World Steel Production

Raw steel, thousands of metric tons

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983*
Argentina	2,205	2,353	2,208	2,410	2,684	2,786	3,199	2,687	2,541	2,900	3,000
Australia	7,699	7,813	7,869	7,794	7,338	7,596	8,119	7,589	7,635	6,400	5,700
Austria	4,238	4,699	4,069	4,476	4,093	4,335	4,917	4,623	4,656	4,300	4,400
Belgium	15,522	16,227	11,582	12,145	11,256	12,601	13,442	12,322	12,283	9,900	9,800
Brazil	7,150	7,515	8,387	9,253	11,253	12,205	13,893	15,309	13,213	13,000	14,200
Bulgaria	2,246	2,188	2,265	2,460	2,589	2,469	2,482	2,567	2,483	2,600	2,500
Canada	13,388	13,623	13,025	13,290	13,631	14,899	16,054	15,901	14,811	11,900	12,000
China*	25,219	21,119	23,903	20,459	23,740	31,780	34,484	37,121	35,600	35,500*	37,000
Czechoslovakia	13,158	13,640	14,324	14,693	15,054	15,294	14,817	14,925	15,270	14,000*	13,500
France	25,270	27,021	21,531	23,227	22,094	22,844	23,360	23,176	21,261	18,400	17,200
W. Germany	49,521	53,232	40,412	42,413	38,984	41,253	46,040	43,838	41,610	35,900	35,200
E. Germany	5,855	6,165	6,480	6,740	6,850	6,976	7,024	7,308	7,467	7,100*	6,600
Hungary	3,332	3,466	3,671	3,652	3,723	3,773	3,907	3,767	3,645	3,800*	3,500
India	6,889	7,068	7,991	9,364	10,009	10,099	10,126	9,514	10,780	11,000	10,400
Italy	20,995	23,804	21,865	23,455	23,335	24,283	24,250	26,501	24,777	12,000	11,500
Japan	119,322	117,131	102,313	107,399	102,405	102,105	111,748	111,395	101,676	99,500	96,500
N. Korea*	2,900	3,200	2,900	3,000	4,000	5,080	5,400	5,800	5,500	5,500*	5,600
S. Korea	1,157	1,947	1,994	3,515	4,347	4,969	7,610	8,558	10,753	11,800	12,000
Luxembourg	5,924	6,447	4,624	4,565	4,329	4,790	4,949	4,618	3,791	3,500	3,400
Mexico	4,760	5,138	5,272	5,298	5,601	6,711	7,005	7,099	7,605	7,100	6,900
Netherlands	5,623	5,837	4,817	5,178	4,923	5,583	5,806	5,264	5,464	4,400	4,200
Poland	14,057	14,556	15,007	15,640	17,841	19,251	19,218	19,485	15,719	14,500*	13,000
Rumania	8,161	8,840	9,549	10,970	11,457	11,780	12,909	13,175	13,025	13,000*	12,500
South Africa	5,722	5,839	6,831	7,106	7,295	7,902	8,876	9,068	9,004	8,200	6,600
Spain	10,800	11,502	11,102	10,982	11,169	11,339	12,248	12,672	12,919	13,100	12,900
Sweden	5,663	5,988	5,611	5,139	3,968	4,327	4,700	4,237	3,770	3,900	4,200
U.K.	26,667	22,384	19,773	22,396	20,467	20,367	21,523	11,342	15,573	13,700	15,300
U.S.S.R.	131,481	136,200	141,325	144,805	146,655	151,400	149,087	147,931	148,517	147,000*	145,000
U.S.	136,902	132,195	105,816	116,120	114,700	124,002	123,276	101,696	108,782	67,600	74,300
Yugoslavia	2,676	2,836	2,916	2,751	3,182	3,456	3,535	3,634	3,977	3,900*	4,100
Others	13,022	13,790	13,548	14,970	17,672	21,061	24,612	25,748	22,749	20,000*	22,000
Total	697,524	703,763	642,900	675,511	675,635	717,159	748,448	716,018	706,856	625,400	625,000

*Estimates. Source International Iron and Steel Institute.

U.S. Yearly Raw Steel Production†

Net Tons

	Openhearth		Basic Oxygen Process		Bessemer**		Electric**		
	Production	Percent of Total Output	Production	Percent of Total Output	Product	Percent of Total Output	Production	Percent of Total Output	Total Production
1952	82,848,439	88.9	....	....	3,523,677	3.8	6,797,923	7.3	93,168,039
1953	100,473,823	90.0	....	....	3,855,705	3.5	7,280,191	6.5	111,609,719
1954	80,327,494	91.0	....	....	2,584,104	2.9	5,436,054	6.1	88,311,652
1955	105,359,417	90.0	307,279	....	3,319,517	2.8	8,049,872	7.2	117,036,085
1956	102,840,585	89.2	506,338	....	3,227,997	2.8	8,641,229	8.0	115,216,149
1957	101,657,776	90.2	611,508	....	2,475,138	2.2	7,970,574	7.6	112,714,996
1958	75,679,394	89.0	1,323,361	1.5	1,395,985	1.6	6,656,145	7.9	85,254,885
1959	81,668,997	87.3	1,864,338	2.0	1,380,283	1.5	8,532,514	9.2	93,446,132
1960	96,367,506	87.0	3,346,150	3.3	1,189,196	1.5	8,378,743	9.2	99,281,601
1961	84,502,071	86.2	3,967,158	4.0	881,060	.89	8,664,203	8.9	98,014,492
1962	82,957,318	84.8	5,552,697	5.2	804,964	.8	9,012,806	9.2	98,327,785
1963	88,833,925	81.3	8,544,078	7.8	962,659	.9	10,920,287	10.0	109,260,949
1964	98,097,499	77.2	15,442,186	12.2	857,586	0.6	12,678,496	10.0	127,075,767
1965	94,193,225	71.7	22,878,605	17.4	585,965	0.4	13,803,806	10.5	131,461,601
1966	85,024,572	63.4	33,928,374	25.4	278,119	0.2	14,870,363	11.0	134,101,428
1967	70,690,028	55.6	41,434,350	32.5	**	**	15,088,545	11.9	127,212,923
1968	65,836,000	50.1	48,812,000	37.2	**	**	16,814,000	12.7	131,462,000
1969	60,894,041	43.1	60,235,671	42.7	**	**	20,131,950	14.2	141,261,662
1970	48,022,000	36.6	63,330,000	48.2	**	**	20,162,000	15.2	131,514,000
1971	35,559,000	29.5	63,943,000	53.1	**	**	20,941,000	17.4	120,443,000
1972	34,936,000	26.2	74,584,000	56.0	**	**	23,721,000	17.8	133,241,000
1973	39,780,000	26.4	83,260,000	55.2	**	**	27,759,000	18.4	150,799,000
1974	35,499,000	24.3	81,552,000	56.0	**	**	28,669,000	19.7	145,720,000
1975	22,161,000	19.1	71,801,000	61.5	**	**	22,680,000	19.4	116,642,000
1976	23,470,000	18.3	79,918,000	62.4	**	**	24,612,000	19.3	128,000,000
1977	20,043,000	16.0	77,408,000	61.8	....	....	27,882,000	22.2	125,333,000
1978	21,310,000	15.5	83,484,000	61.0	....	....	32,287,000	23.5	137,031,000
1979	19,158,000	14.0	83,258,000	61.0	....	....	33,927,000	23.0	136,341,000
1980	13,054,000	11.7	67,615,000	60.4	....	....	31,166,000	27.9	111,835,000
1981	13,452,000	11.1	73,231,000	60.6	....	....	34,145,000	28.3	120,828,000
1982	6,115,000	8.2	45,268,000	60.7	....	....	23,193	31.1	74,577,000
1983††	....	....	....	....	....	....	....	....	83,500,000

*Includes very small tonnages of crucible steel. †† IRON AGE estimate. Source: American Iron & Steel Institute.
**Included in openhearth since 1966. † Steel in first solid state after melting suitable for further processing or sale, including ingots, steel castings and strand or pressure cast blooms, billets, slabs, or other product forms.

INDEX

IRON

Supply of Ore in U.S. 104

NONFERROUS PRICES

Aluminum, Ingot 103
Copper, Electrolytic 103
Lead 106
Nickel, Electrolytic 106
Tin, Straits 103
Zinc, Prime Western 106

NONFERROUS PRODUCTION

Aluminum, Primary 102
Copper, Refined 102
Lead, Refined 102
Zinc, Slab 102

PIG IRON

Composite Price, Iron Age 99
Production of Pig Iron 104

STEEL PRICES

Composite Price, Averages 96
Composite by Periods 96
Cold-Rolled Sheets 99
Hot-Rolled Sheets 98
Hot-Rolled Strip 98
Special Quality Bars 99
Plates 99
Shapes 99
Tinplate 98

STEEL PRODUCTION

U.S. Monthly Steel Output 96
U.S. Yearly Steel Output 95
U.S. Capability Utilization 96
World Steel Output 95

STEEL SCRAP

Iron Age Composites 102
Chicago 101
Philadelphia 101
Pittsburgh 101

U.S. Monthly Raw Steel† Production, Net Tons

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Jan.	6,753,912	9,317,385	12,049,404	6,416,004	10,352,748	8,390,914	9,526,000	11,830,469	10,577,000	10,633,000	12,014,599	11,083,447	11,242,855
Feb.	5,782,323	9,602,938	11,126,806	6,239,098	9,698,316	8,222,352	9,485,359	10,865,869	10,249,000	10,041,000	11,794,896	10,915,021	10,498,356
Mar.	6,254,622	11,567,745	11,564,683	7,086,389	10,583,943	10,080,014	10,496,987	12,346,963	12,083,000	10,963,000	12,721,053	12,400,375	11,885,581
Apr.	5,532,961	11,281,920	9,777,857	7,584,687	9,235,881	10,695,382	10,560,651	11,966,162	11,570,000	10,349,000	12,450,040	12,142,751	11,385,675
May	6,301,159	11,600,581	8,830,472	8,980,626	7,535,506	11,489,524	11,060,357	12,012,449	12,191,000	10,577,000	12,700,325	12,356,384	11,574,485
June	7,127,480	10,907,834	7,404,873	8,551,856	6,691,785	10,365,154	10,184,634	11,593,450	11,403,000	9,576,000	11,905,936	11,810,287	11,323,096
July	6,420,405	5,227,129	6,350,924	8,091,956	6,174,187	8,653,544	10,105,609	11,550,988	10,791,000	9,620,000	11,452,388	11,365,146	10,780,960
Aug.	7,286,003	1,439,277	6,838,000	8,660,527	7,097,916	7,781,560	10,515,268	11,324,149	11,097,000	10,300,000	8,955,712	11,420,995	10,764,738
Sept.	7,610,372	1,535,017	6,458,421	8,904,000	7,251,023	7,858,009	10,668,978	9,949,355	11,280,000	10,438,000	8,085,770	11,523,106	10,726,618
Oct.	8,839,778	1,704,533	6,868,380	9,173,170	7,780,538	8,483,160	11,568,248	9,295,828	11,509,000	11,171,000	9,006,237	12,323,544	10,698,720
Nov.	8,569,318	7,267,607	6,171,940	8,745,986	7,846,057	8,488,239	11,292,070	8,822,186	10,887,000	11,299,000	9,590,000	11,916,305	10,008,000
Dec.	8,710,522	11,989,319	5,839,841	9,568,954	8,079,885	8,753,117	11,611,606	9,627,156	10,435,000	11,953,000	10,421,000	11,812,097	10,438,000
Total	**85,254,885**	**93,446,132**	**99,281,891**	**98,014,492**	**98,327,785**	**109,266,949**	**127,075,767**	**131,461,661**	**134,101,000**	**127,213,000**	**131,462,000**	**141,261,662**	**131,514,000**

	1971*	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Jan.	11,273,740	10,001,028	12,372,882	12,726,000	11,584,190	9,834,725	9,089,254	10,301,277	11,104,826	10,700,736	10,590,135,	7,737,389	5,570,000
Feb.	10,874,377	9,979,752	11,625,734	11,598,000	10,861,663	9,906,523	8,858,898	9,643,242	10,562,363	10,331,868	10,028,344	7,177,979	5,676,000
Mar.	12,645,241	11,587,946	13,088,378	12,758,000	11,980,244	11,294,279	11,049,228	11,082,593	12,575,987	11,438,944	11,744,370	8,048,621	7,127,000
Apr.	12,564,686	11,587,706	12,788,629	12,442,000	10,667,492	11,439,185	11,166,557	11,528,367	12,195,612	10,658,202	11,242,726	7,005,717	7,292,000
May	12,920,415	11,936,558	13,174,066	12,752,000	9,863,557	12,136,009	12,200,852	12,320,398	12,788,673	9,225,991	11,422,988	6,678,457	7,412,000
June	11,490,602	10,979,970	12,487,656	12,185,000	8,743,842	11,604,506	11,383,812	11,860,523	12,229,990	7,500,772	10,451,364	6,050,062	3,993,000
July	9,942,264	10,341,230	12,290,250	12,155,000	8,370,426	11,399,954	10,319,277	11,387,671	11,821,349	6,795,726	10,159,544	5,718,617	3,912,000
Aug.	5,773,7[illegible]	10,842,279	12,181,330	11,837,000	8,648,260	11,128,102	10,392,460	11,549,515	11,309,493	7,018,547	10,120,254	5,537,970	7,020,000
Sept.	7,678,110	10,912,540	12,229,008	11,849,000	9,295,321	10,462,577	10,050,311	11,467,224	10,541,320	7,766,905	9,618,072	5,298,622	7,134,000
Oct.	8,211,000	11,656,841	12,875,791	12,617,045	9,213,736	10,278,000	10,442,000	12,105,000	10,809,986	9,442,103	9,002,756	5,262,370	7,692,000
Nov.	8,053,140	11,398,316	12,586,509	11,614,000	8,709,090	9,494,000	9,748,000	11,654,000	9,997,000	10,057,000	7,962,000	4,546,000	7,650,000*
Dec.	8,783,805	11,878,199	12,721,577	10,960,000	8,845,511	9,215,000	10,031,000	11,812,000	9,996,000	10,180,000	7,671,000	4,456,000	7,100,000*
Total	**120,442,526**	**133,241,165**	**150,798,927**	**145,720,000**	**116,783,332**	**128,000,000**	**125,333,000**	**137,031,000**	**136,341,000**	**111,835,000**	**120,828,000**	**74,577,000**	**83,500,000***

*Estimate

Source: American Iron and Steel Institute

† Steel in first solid state after melting suitable for further processing or sale, including ingots, steel castings and continuous or pressure cast blooms, billets, slabs, or other product forms.

U.S. Raw Steel Production, Rate of Capability Utilization

	1965†	1966††	1967		1968	1969	1970	1971	1972	1973	1974		1975†††	1976	1977	1978	1979	1980	1981	1982	1983
Jan.	143.4	97.9	98.4	Jan.	111.2	102.6	104.1	104.3	92.6	114.5	117.8	Jan.	90.4	74.4	66.8	77.2	83.5	82.7	79.9	59.3	43.4
Feb.	145.8	105.0	102.9	Feb.	116.7	111.8	107.6	111.4	98.7	119.1	118.8	Feb.	93.8	80.1	72.1	80.1	87.9	85.3	83.7	60.9	49.0
Mar.	149.7	111.8	101.5	Mar.	117.7	114.8	110.0	117.0	107.3	121.1	118.1	Mar.	93.4	85.4	81.2	83.1	94.5	88.4	88.6	61.7	55.5
Apr.	149.9	110.6	99.0	Apr.	119.1	116.1	108.9	120.2	110.8	122.3	119.0	Apr.	84.9	88.4	83.3	88.5	93.4	83.0	87.7	55.2	58.9
May	145.6	112.8	97.9	May	117.5	114.4	107.1	119.6	110.5	121.9	118.0	May	75.9	90.8	88.1	91.5	94.8	69.6	86.2	50.9	57.9
June	145.2	109.1	91.6	June	113.9	113.0	108.3	109.3	105.0	119.4	116.5	June	69.6	89.7	84.9	91.1	93.7	58.4	81.5	47.7	56.5
July	140.0	99.9	89.0	July	106.0	105.2	99.8	92.0	95.7	113.8	112.5	July	65.1	84.8	76.7	85.1	89.9	53.1	77.6	43.8	54.3
Aug.	137.3	102.7	95.3	Aug.	82.9	105.7	99.6	53.4	100.4	112.7	109.6	Aug.	67.3	82.8	77.2	86.3	86.0	54.8	77.3	42.4	55.1
Sept.	124.6	107.9	99.8	Sept.	77.3	110.2	102.6	73.4	104.4	117.0	113.3	Sept.	74.7	80.4	77.2	88.6	82.8	62.7	75.9	41.9	57.8
Oct.	112.7	106.5	103.4	Oct.	83.4	114.1	99.0	76.0	107.9	119.2	116.8	Oct.	69.0	75.8	77.7	88.1	84.4	72.2	68.7	40.2	60.2
Nov.	110.5	104.1	108.1	Nov.	91.7	114.0	95.7	77.0	109.0	120.4	111.1	Nov.	67.4	72.2	75.0	89.4	80.6	79.5	62.8	35.9	57.8*
Dec.	116.7	96.6	110.6	Dec.	96.5	109.3	96.6	81.3	109.9	117.7	101.4	Dec.	66.2	67.8	74.7	87.7	78.0	77.8	58.6	34.0	56.7*
Average	135.3	105.6	100.0	Average	103.1	111.0	103.4	94.7	104.5	118.5	114.5	Average	76.2	80.9	78.4	86.8	87.8	72.8	78.3	47.8	55.3*

*Estimate. †AISI Index of Production (1957-1959=100). ††Production Index 1967=100, revised back to 1966 in Jan. 1971.
†††Rate of Capability Utilization, begun January, 1976, revised back to January, 1975.

Source: AISI

STEEL PRICES

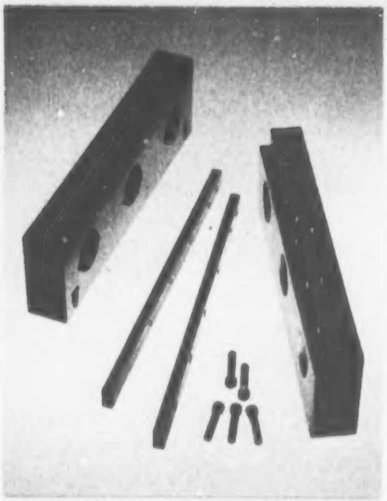
Composite Prices by Periods

Period	Cents per Pound
Sept. 5. 1977 to Jan. 30, 1978	16.043
Jan. 30, 1978 to Feb. 27, 1978	17.301
Feb. 27, 1978 to April 3, 1978	17.393
April 3, 1978 to April 17, 1978	17.672
April 17, 1978 to July 31, 1978	17.670
July 31, 1978 to Dec. 31, 1978	18.719
Jan. 1, 1979 to April 1, 1979	19.549
April 1, 1979 to May 13, 1979	19.606
May 13, 1979 to July 1, 1979	19.668
July 1, 1979 to July 9, 1979	20.095
July 9, 1979 to Oct. 1, 1979	20.311
Oct. 1, 1979 to Jan. 6, 1980	20.547
Jan. 7, 1980 to Mar. 1, 1980	21.038
Mar. 2, 1980 to Mar. 9, 1980	21.130
Mar. 10, 1980 to Mar. 31, 1980	21.180
Apr. 1, 1980 to July 6, 1980	21.739
July 7, 1980 to Oct. 4, 1980	21.736
Oct. 5, 1980 to Nov. 30, 1980	22.019
Dec. 1, 1980 to Dec. 31, 1980	22.286
Jan. 1, 1981 to Feb. 1, 1981	22.901
Feb. 2, 1981 to Feb. 28, 1981	23.362
Mar. 1, 1981 to Mar. 28, 1981	23.598
Mar. 29, 1981 to June 20, 1981	23.776
June 21, 1981 to Sept. 26, 1981	24.488
Sept. 27, 1981 to April 3, 1982	25.195
April 4, 1982 to Feb. 5, 1983	25.297
Feb. 6, 1983 to Feb. 13, 1983	25.954
Feb. 14, 1983 to Aug. 31, 1983	26.217
Sept. 1, 1983 to Dec. 31, 1983	26.822

The Iron Age Finished Steel Composite Price

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
January	6.368	6.368	6.368	6.445	6.545	6.794	7.263	7.838	9.014	9.363
February	6.368	6.368	6.388	6.448	6.545	6.904	7.351	7.838	8.998	9.363
March	6.368	6.368	6.383	6.448	6.545	6.961	7.434	8.012	8.998	9.363
April	6.368	6.368	6.383	6.448	6.545	6.961	7.504	8.055	8.998	9.363
May	6.368	6.368	6.383	6.448	6.545	7.042	7.560	8.055	8.998	9.363
June	6.368	6.368	6.376	6.448	6.545	7.042	7.813	8.234	8.998	9.363
July	6.368	6.368	6.376	6.448	6.545	7.125	7.813	8.480	8.998	9.363
August	6.368	6.368	6.376	6.448	6.767	7.252	7.813	8.728	8.998	9.363
September	6.368	6.368	6.433	6.485	6.767	7.252	7.813	8.977	8.998	9.363
October	6.368	6.368	6.445	6.496	6.767	7.252	7.813	8.977	8.998	9.432
November	6.368	6.368	6.445	6.496	6.538	7.252	7.813	8.977	8.998	9.432
December	6.368	6.368	6.445	6.510	6.538	7.263	7.813	8.977	8.998	9.432
Average	6.368	6.368	6.399	6.464	6.600	7.091	7.650	8.429	8.998	9.380

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
January	9.456	12.739	13.693	15.146	16.294	19.549	20.943	22.901	25.195	25.297
February	9.480	12.928	13.693	15.146	17.324	19.549	21.038	23.362	25.195	25.978
March	9.480	12.928	13.693	15.146	17.393	19.549	21.168	23.598	25.195	25.954
April	10.033	12.928	13.693	15.146	17.670	19.606	21.739	23.776	25.297	25.954
May	10.033	12.928	13.835	15.146	17.670	19.637	21.739	23.776	25.297	25.954
June	11.108	12.920	14.186	15.146	17.670	19.668	21.739	24.232	25.297	25.954
July	12.075	12.912	14.502	15.941	17.670	20.253	21.736	24.488	25.297	25.954
August	12.346	12.912	14.598	15.941	18.719	20.311	21.736	24.488	25.297	25.954
September	12.389	12.961	14.598	16.043	18.719	20.311	21.736	24.488	25.297	26.822
October	12.433	13.692	14.598	16.043	18.719	20.547	21.982	25.195	25.297	26.822
November	12.433	13.693	14.598	16.043	18.719	20.547	22.019	25.195	25.297	26.822
December	12.433	13.693	14.880	16.043	18.719	20.547	22.286	25.195	25.297	26.822
Average	11.141	13.102	14.213	15.577	17.940	20.006	21.655	24.224	25.271	26.190



All scrap chopper blades are not created equal.

Kennametal scrap chopper blades with indexable carbide cutting edges give you the kind of high quality and performance that keeps your work area clear, and rolled steel moving at a productive pace.

You'll have less downtime when you replace tool steel blades with our tough, long-wearing carbide scrap chopper blades. But, when you do need to change the cutting edge, a simplified design and a dimensionally stable blade permits you to make the change quickly and accurately so you are up and running in minutes. You also get the economy of four indexable cutting edges, and the added economy of our reuseable blade body.

And with any one of our three carbide grades, you can handle varying types and gauges of steel, even workhardened material, without having to stop and reset your blades or machinery.

Equally valuable is our service after the sale. We want to help you be productive. Our technical staff and facilities are ready to help you now and down the road.

For more information about our quality steel mill products, contact Kennametal Inc., P.O. Box 346, Latrobe, PA 15650. Phone 412-539-5000.

KENNAMETAL®

Where there's service after the sale.

A81-350

For Information, Circle 142

Hot-Rolled Sheets
At Pittsburgh, Cents Per Pound

	1972	1973	1974	1975	1976	1977
Jan	8.60	8.35	8.55	11.00	11.70	13.25
Feb	8.35	8.35	8.55	11.00	11.70	13.25
Mar	8.35	8.35	8.55	11.00	11.70	13.25
Apr	8.35	8.35	8.55	11.00	11.70	13.25
May	8.35	8.35	9.55	11.00	11.70	13.25
June	8.35	8.35	9.55	11.00	11.70	13.25
July	8.35	8.35	11.00	11.00	12.45	14.175
Aug	8.35	8.35	11.00	11.00	12.45	14.175
Sept	8.35	8.35	11.00	11.00	12.45	14.175
Oct	8.35	8.55	11.00	11.70	12.45	14.175
Nov	8.35	8.55	11.00	11.70	12.45	14.175
Dec	8.35	8.55	11.00	11.70	13.25	14.175
Average	8.37	8.40	9.94	11.17	12.14	13.712

	1978	1979	1980	1981	1982	1983
Jan	14.175	16.60	17.50	19.50	20.80	20.80
Feb	14.175	16.60	17.50	19.50	20.80	22.05
Mar	14.1750	16.60	17.50	19.50	20.80	22.05
Apr	14.175	16.60	18.45	19.50	20.80	22.05
May	15.275	16.60	18.45	19.50	20.80	22.05
June	15.275	16.60	18.45	20.15	20.80	22.05
July	15.275	16.60	18.45	20.80	20.80	22.05
Aug	15.80	17.50	18.45	20.80	20.80	22.05
Sept	15.80	17.50	18.45	20.80	20.80	23.75
Oct	15.80	17.50	18.45	20.80	20.80	23.75
Nov	15.80	17.50	18.45	20.80	20.80	23.75
Dec	15.80	17.50	18.45	20.80	20.80	23.75
Average	15.12	16.97	18.21	20.20	20.80	22.51

Hot-Rolled Strip
At Pittsburgh, Cents Per Pound

	1972	1973	1974	1975	1976	1977
Jan	8.40	8.15	8.375	11.00	11.70	13.25
Feb	8.15	8.15	8.375	11.00	11.70	13.25
Mar	8.15	8.15	8.375	11.00	11.70	13.25
Apr	8.15	8.15	8.375	11.00	11.70	13.25
May	8.15	8.15	9.50	11.00	11.70	13.25
June	8.15	8.15	9.50	11.00	11.70	13.25
July	8.15	8.15	11.00	11.00	12.45	14.175
Aug	8.15	8.15	11.00	11.00	12.45	14.175
Sept	8.15	8.15	11.00	11.00	12.45	14.175
Oct	8.15	8.375	11.00	11.70	12.45	14.175
Nov	8.15	8.375	11.00	11.70	12.45	14.175
Dec	8.15	8.375	11.00	11.70	13.25	14.175
Average	8.17	8.206	9.875	11.17	12.15	13.70

	1978	1979	1980	1981	1982	1983
Jan	14.175	16.60	17.50	19.50	20.80	20.80
Feb	14.175	16.60	17.50	19.50	20.80	22.05
Mar	14.175	16.60	17.50	19.50	20.80	22.05
Apr	14.175	16.60	18.45	19.50	20.80	22.05
May	15.275	16.60	18.45	19.50	20.80	22.05
June	15.275	16.60	18.45	20.15	20.80	22.05
July	15.275	16.60	18.45	20.80	20.80	22.05
Aug	15.80	17.50	18.45	20.80	20.80	22.05
Sept	15.80	17.50	18.45	20.80	20.80	23.75
Oct	15.80	17.50	18.45	20.80	20.80	23.75
Nov	15.80	17.50	18.45	20.80	20.80	23.75
Dec	15.80	17.50	18.45	20.80	20.80	23.75
Average	14.79	16.97	18.21	20.20	20.80	22.51

Tinplate
Single Reduced, 70 lb.
Dollars Per Base Box, Pittsburgh

	1970	1971	1972	1973	1974	1975	1976
Jan	$7.70	$8.85	$9.35	$9.35	$9.75	$13.70	$13.70
Feb	7.70	8.85	9.35	9.35	9.75	13.70	13.70
Mar	7.70	8.85	9.35	9.75	10.15	13.70	15.10
Apr	7.95	8.85	9.35	9.75	10.15	13.70	15.10
May	8.20	8.85	9.35	9.75	10.15	13.70	15.10
June	8.20	8.85	9.35	9.75	11.30	13.70	15.10
July	8.20	8.85	9.35	9.75	11.30	13.30	15.10
Aug	8.20	8.85	9.35	9.75	11.30	13.70	15.10
Sept	8.20	8.85	9.35	9.75	11.30	13.70	15.10
Oct	8.55	8.85	9.35	9.75	11.30	13.70	15.10
Nov	8.55	8.85	9.35	9.75	13.45	13.70	15.10
Dec	8.55	8.85	9.35	9.75	13.45	13.70	15.10
Average	8.22	8.85	9.35	9.68	11.11	13.70	14.86

	1977	1978	1979	1980	1981	1982	1983
Jan	$15.10	$17.05	$19.01	$21.93	$24.94	$26.29	$26.29
Feb	15.10	17.05	19.27	21.93	24.94	26.29	26.29
Mar	15.75	17.80	19.27	21.93	24.94	26.29	26.29
Apr	15.75	17.80	20.57	23.31	24.94	26.29	26.29
May	15.75	18.00	20.57	23.31	24.94	26.29	26.29
June	15.75	18.00	20.57	23.31	24.94	26.29	26.29
July	15.75	18.00	20.57	23.31	24.94	26.29	26.29
Aug	15.75	18.00	20.57	21.31	24.94	26.29	26.29
Sept	17.05	18.00	20.57	21.31	24.94	26.29	27.74
Oct	17.05	19.10	21.93	21.31	24.94	26.29	27.74
Nov	17.05	19.10	21.93	21.31	24.94	26.29	27.74
Dec	17.05	19.10	21.93	21.31	24.94	26.29	27.74
Average	16.07	18.08	20.57	22.89	24.94	26.29	26.77

Galvanized Sheets
At Pittsdburgh, Cents Per Pound†

	1972	1973	1974	1975	1976	1977
Jan	10.875	10.525	10.80	14.05	15.40	17.40
Feb	10.525	10.525	10.80	14.05	15.40	17.40
Mar	10.525	10.525	10.80	14.05	15.40	17.40
Apr	10.525	10.525	10.80	14.05	15.40	17.40
May	10.525	10.525	12.15	14.05	15.40	17.40
June	10.525	10.525	12.15	14.05	16.40	17.40
July	10.525	10.525	14.05	14.05	16.40	18.60
Aug	10.525	10.525	14.05	14.05	16.40	18.60
Sept	10.525	10.525	14.05	14.05	16.40	18.60
Oct	10.525	10.80	14.05	15.40	16.40	18.60
Nov	10.525	10.80	14.05	15.40	16.40	18.60
Dec	10.525	10.80	14.05	15.40	17.40	18.60
Average	10.554	10.50	12.65	14.39	16.07	18.00

	1978	1979	1980	1981	1982	1983
Jan	18.60	21.95	22.85	25.25	26.25	26.25
Feb	19.80	21.95	22.85	25.25	26.25	28.00
Mar	19.80	21.95	22.85	25.25	26.25	28.00
Apr	19.80	21.95	23.80	25.25	26.25	28.00
May	20.075	21.95	23.80	25.25	26.25	28.00
June	20.075	21.95	23.80	26.20	26.25	28.00
July	20.075	21.95	23.80	27.15	26.25	28.00
Aug	20.80	22.85	23.80	27.15	26.25	28.00
Sept	20.80	22.85	23.80	27.15	26.25	30.30
Oct	20.80	22.85	23.80	27.15	26.25	30.30
Nov	20.80	22.85	23.80	27.15	26.25	30.30
Dec	20.80	22.85	23.80	27.15	26.25	30.30
Average	20.18	22.32	23.56	26.30	26.25	28.62

†Hot-Dipped, 10 ga.

Cold-Rolled Sheets
At Pittsburgh, Cents Per Pound

	1972	1973	1974	1975	1976	1977
Jan	9.25	10.075	10.30	13.00	13.90	15.80
Feb	10.075	10.075	10.30	13.00	13.90	15.80
Mar	10.075	10.075	10.30	13.00	13.90	15.80
Apr	10.075	10.075	10.30	13.00	13.90	15.80
May	10.075	10.075	11.30	13.00	13.90	15.80
June	10.075	10.075	11.30	13.00	13.90	15.80
July	10.075	10.075	13.00	13.00	14.80	16.90
Aug	10.075	10.075	13.00	13.00	14.80	16.90
Sept	10.075	10.075	13.00	13.00	14.80	16.90
Oct	10.075	10.30	13.00	13.90	14.80	16.90
Nov	10.075	10.30	13.00	13.90	14.80	16.90
Dec	10.075	10.30	13.00	13.90	15.80	16.90
Average	9.312	10.13	11.82	13.22	14.43	16.35

	1978	1979	1980	1981	1982	1983
Jan	16.90	19.75	20.75	23.15	24.65	24.65
Feb	16.90	19.75	20.75	23.15	24.65	26.15
Mar	16.90	19.75	20.75	23.15	24.65	26.15
Apr	16.90	19.75	21.90	23.15	24.65	26.15
May	18.175	19.75	21.90	23.15	24.65	26.15
June	18.175	19.75	21.90	23.90	24.65	26.15
July	18.175	19.75	21.90	24.65	24.65	26.15
Aug	18.80	20.75	21.90	24.65	24.65	26.15
Sept	18.80	20.75	21.90	24.65	24.65	26.15
Oct	18.80	20.75	21.90	24.65	24.65	26.15
Nov	18.80	20.75	21.90	24.65	24.65	26.15
Dec	18.80	20.75	21.90	24.65	24.65	26.15
Average	17.17	20.16	21.62	23.96	24.65	26.69

Structural Steel Shapes
At Pittsburgh, Cents Per Pound

	1978	1979	1980	1981	1982	1983
Jan	14.55	17.00	18.00	19.90	22.90	23.90
Feb	14.55	17.00	18.00	19.90	22.90	23.90
Mar	14.55	17.00	18.90	19.90	22.90	23.90
Apr	14.55	17.00	18.90	21.65	23.90	23.90
May	15.725	17.15	18.90	21.65	23.90	23.90
June	15.725	17.30	18.90	21.65	23.90	23.90
July	15.725	17.30	18.90	21.65	23.90	23.90
Aug	16.25	17.30	18.90	21.65	23.90	23.90
Sept	16.25	17.30	18.90	21.65	23.90	23.90
Oct	16.25	18.00	19.90	22.90	23.90	23.90
Nov	16.25	18.00	19.90	22.90	23.90	23.90
Dec	16.25	18.00	19.90	22.90	23.90	23.90
Average	15.58	17.36	19.00	21.52	23.65	23.90

Special Quality Bars
At Pittsburgh, Cents Per Pound

	1978	1979	1980	1981	1982	1983
Jan	16.15	19.10	21.00	22.80	23.95	23.95
Feb	16.15	19.10	21.00	22.80	23.95	25.80
Mar	16.15	19.10	21.00	22.80	23.95	25.80
Apr	16.15	19.10	21.00	22.80	23.95	25.80
May	17.525	19.10	21.00	22.80	23.95	25.80
June	17.525	19.10	21.00	23.95	23.95	25.80
July	17.525	19.10	21.00	23.95	23.95	25.80
Aug	18.15	19.85	21.00	23.95	23.95	25.80
Sept	18.15	19.85	21.00	23.95	23.95	25.80
Oct	18.15	19.85	21.00	23.95	23.95	25.80
Nov	18.15	19.85	22.80	23.95	23.95	25.80
Dec	18.15	19.85	22.80	23.95	23.95	25.80
Average	17.33	19.41	21.30	23.29	23.95	25.65

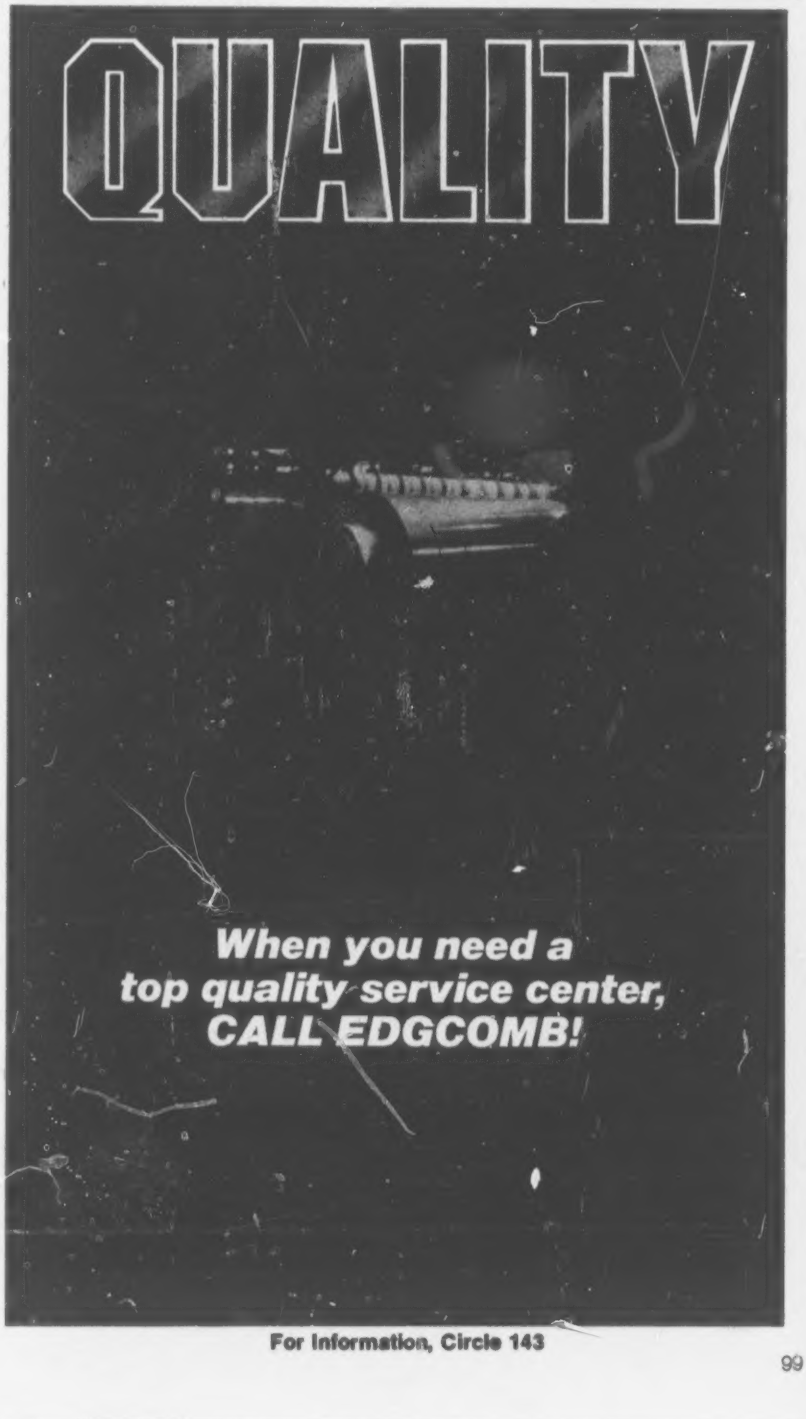
Steel Plates
At Pittsburgh, Cents Per Pound

	1978	1979	1980	1981	1982	1983
Jan	15.10	17.85	19.45	21.50	24.25	24.25
Feb	15.10	17.85	19.45	21.50	24.25	25.75
Mar	15.10	17.85	19.45	23.25	24.25	25.75
Apr	15.10	17.85	20.70	23.25	24.25	25.75
May	16.425	18.17	20.70	23.25	24.25	25.75
June	16.425	18.50	20.70	23.25	24.25	25.75
July	16.425	18.50	20.70	23.25	24.25	25.75
Aug	17.05	18.50	20.70	23.25	24.25	25.75
Sept	17.05	18.50	20.70	23.25	24.25	25.75
Oct	17.05	19.45	21.50	24.25	24.25	25.75
Nov	17.05	19.45	21.50	24.25	24.25	25.75
Dec	17.05	19.45	21.50	24.25	24.25	25.75
Average	16.24	18.49	20.62	23.20	24.25	25.625

Composite Pig Iron Price

Average of Iron Age quotes on basic and foundry iron per net ton.

	1978	1979	1980	1981	1982	1983
Jan	$191.75	$203.00	$203.00	$203.00	$213.00	$213.00
Feb	191.75	203.00	203.00	203.00	213.00	213.00
Mar	191.75	203.00	203.00	203.00	213.00	213.00
Apr	191.75	203.00	203.00	203.00	213.00	213.00
May	191.75	203.00	203.00	203.00	213.00	213.00
June	203.00	203.00	203.00	203.00	213.00	213.00
July	203.00	203.00	203.00	203.00	213.00	213.00
Aug	203.00	203.00	203.00	203.00	213.00	213.00
Sept	203.00	203.00	203.00	203.00	213.00	213.00
Oct	203.00	203.00	203.00	203.00	213.00	213.00
Nov	203.00	203.00	203.00	203.00	213.00	213.00
Dec	203.00	203.00	203.00	213.00	213.00	213.00
Average	$198.31	$203.00	$203.00	213.00	$213.00	$213.00



When you need a top quality service center, CALL EDGCOMB!

For Information, Circle 143

SCRAP COMPOSITES

Philadelphia

*Estimate

Prices of No. 1 Scrap, Per Gross Ton

	1978	1979	1980	1981	1982	1983
Jan	$68.70	$101.10	$100.50	$95.75	$75.25	$57.50
Feb	72.75	110.75	108.00	91.50	75.50	62.50
Mar	76.00	110.25	101.50	91.50	72.90	63.50
Apr	74.75	97.70	92.75	90.00	71.50	65.00
May	71.10	90.75	82.50	84.50	65.00	65.70
June	74.30	93.08	76.10	79.50	60.30	68.50
July	78.00	91.50	83.00	79.50	59.50	68.50
Aug	78.00	89.25	88.25	79.30	59.50	68.50
Sept	75.50	88.50	91.90	78.50	59.50	69.50
Oct	76.30	87.30	91.50	69.50	57.00	71.50
Nov	84.00	88.50	91.50	66.50	54.70	78.00
Dec	91.50	92.70	96.50	66.50	54.50	83.50*
Average	76.74	95.10	92.00	81.05	63.76	68.50*

No. 2 Bundles

*Estimate

	1978	1979	1980	1981	1982	1983
Jan	$46.90	$60.10	$72.00	$64.00	$43.50	$40.50
Feb	51.25	66.50	76.25	60.75	43.50	45.00
Mar	53.50	72.25	71.50	60.50	43.50	46.50
Apr	51.75	62.70	64.75	60.50	41.50	45.50
May	47.30	64.50	53.25	57.50	40.50	43.70
June	50.10	66.50	51.10	54.50	40.10	43.00
July	51.50	66.50	56.00	54.50	39.50	41.25
Aug	51.50	61.50	63.00	54.30	39.50	40.50
Sept	49.50	59.25	65.10	51.50	39.50	40.50
Oct	48.70	58.50	64.50	46.00	39.50	43.70
Nov	55.50	60.00	64.50	39.30	39.50	49.50
Dec	56.50	66.30	63.50	37.50	39.80	54.50*
Average	51.17	63.71	63.93	53.41	40.80	44.52*

Pittsburgh

*Estimate

Prices of No. 1 Scrap, Per Gross Ton

	1978	1979	1980	1981	1982	1983
Jan	$71.50	$ 93.30	$102.06	$104.50	$94.50	$63.90
Feb	72.00	111.75	106.50	105.75	91.50	73.25
Mar	74.50	127.75	105.50	116.10	85.90	78.25
Apr	77.50	102.90	98.00	110.75	75.50	75.50
May	73.10	102.75	79.50	105.10	64.50	69.10
June	74.70	105.50	69.50	100.00	61.50	72.50
July	77.50	99.90	77.75	102.50	59.00	74.50
Aug	77.00	93.50	87.50	107.10	57.50	79.70
Sept	73.75	89.25	102.90	101.50	57.50	82.50
Oct	75.70	87.30	102.50	93.00	55.25	82.90
Nov	83.25	94.50	105.25	84.90	52.50	85.50
Dec	87.00	95.70	103.10	87.25	53.75	90.50*
Average	76.45	100.34	95.00	101.54	67.41	77.35*

No. 2 Bundles

*Estimate

	1978	1979	1980	1981	1982	1983
Jan	$50.30	$60.10	$61.00	$74.50	$60.50	$43.10
Feb	49.75	70.50	67.50	74.50	62.50	50.75
Mar	49.50	78.75	68.70	77.30	53.70	54.50
Apr	50.25	67.70	64.50	81.50	48.75	51.50
May	47.10	69.75	58.75	73.50	46.50	51.50
June	47.70	74.50	52.70	65.70	44.50	51.50
July	52.00	68.30	54.50	64.50	44.50	51.50
Aug	49.75	64.75	63.50	64.50	44.50	51.50
Sept	46.50	62.75	66.50	64.50	42.50	51.50
Oct	46.30	59.30	66.50	63.00	40.25	51.50
Nov	51.00	59.25	69.75	60.50	38.10	52.75
Dec	55.25	59.50	73.90	60.50	37.50	59.50*
Average	49.61	66.26	63.98	68.71	46.98	51.76*

Chicago

Prices of No. 1 Scrap, Per Gross Ton

	1978	1979	1980	1981	1982	1983
Jan	$71.50	$ 98.30	$ 96.50	$ 95.50	$83.25	$62.70
Feb	71.50	109.75	100.50	101.25	79.50	74.25
Mar	72.25	121.25	96.50	108.10	71.70	77.50
Apr	76.00	99.30	86.00	104.50	67.00	72.50
May	71.50	99.75	[illegible]	96.75	58.50	68.30
June	75.30	104.00	63.50	88.50	52.30	71.50
July	77.75	96.90	67.50	88.50	49.50	72.25
Aug	74.00	88.25	77.50	97.50	50.70	76.90
Sept	69.50	86.50	88.50	91.25	51.50	79.50
Oct	72.50	87.30	93.75	81.00	46.50	79.50
Nov	83.00	94.50	98.75	75.50	46.50	80.75
Dec	91.25	93.90	105.10	75.50	49.50	84.50*
Average	75.50	98.30	87.05	91.99	58.87	75.02*

No. 2 Bundles

*Estimate

	1978	1979	1980	1981	1982	1983
Jan	$46.50	$64.50	$54.50	$77.00	$65.50	$44.90
Feb	46.75	67.50	58.50	80.25	62.50	50.75
Mar	48.50	68.75	57.50	83.70	56.50	54.50
Apr	51.50	59.90	53.25	83.25	52.50	49.50
May	51.10	63.00	49.50	73.25	47.50	44.50
June	49.30	61.50	48.30	64.50	43.90	44.50
July	50.00	53.50	51.50	65.75	41.50	44.50
Aug	48.00	49.50	61.50	68.70	41.50	44.50
Sept	46.50	50.25	72.10	69.00	41.50	44.50
Oct	48.50	52.50	81.75	60.50	38.50	44.50
Nov	54.50	56.50	87.50	60.50	38.50	45.75
Dec	59.75	57.30	86.50	63.25	39.25	53.00*
Average	50.07	58.72	63.24	70.81	47.43	47.12*

COMPETITIVE
When you're
looking for the right price...
CALL EDGCOMB!

For Information, Circle 144

SCRAP COMPOSITES

Average of Iron Age Scrap Prices Pittsburgh, Chicago, Philadelphia, Gross Ton

No. 1 Heavy Melting

*Estimate

	1978	1979	1980	1981	1982	1983
Jan	$70.56	$ 97.56	$ 99.67	$ 96.58	$84.34	$61.30
Feb	72.08	110.75	105.00	99.50	82.17	70.00
Mar	74.25	119.75	101.17	105.23	76.83	73.09
Apr	76.06	99.96	92.25	101.75	71.33	71.00
May	71.90	97.75	77.50	95.42	62.67	67.70
June	74.76	100.83	89.70	89.37	58.03	70.84
July	77.25	96.10	76.06	90.17	56.00	71.75
Aug	76.33	90.33	84.42	94.63	55.90	75.04
Sept	72.91	88.06	94.43	90.42	56.17	77.17
Oct	74.83	87.30	95.91	81.17	52.92	77.97
Nov	83.41	92.50	98.50	75.63	51.23	81.42
Dec	89.91	94.10	101.57	76.42	52.50	86.17*
Average	76.23	97.91	91.35	91.53	63.35	73.63

No. 2 Bundles

*Estimate

	1978	1979	1980	1981	1982	1983
Jan	$47.90	$61.56	$62.50	$71.83	$56.50	$42.84
Feb	49.25	68.17	67.41	71.83	56.17	48.84
Mar	50.50	73.25	65.90	73.83	51.23	51.84
Apr	51.17	63.43	60.83	75.08	47.58	48.84
May	48.50	65.75	53.83	68.08	44.83	46.57
June	49.03	67.50	50.70	61.57	42.83	46.34
July	51.16	62.76	54.00	61.58	41.83	45.75
Aug	49.75	58.58	62.66	62.50	41.83	45.50
Sept	47.50	57.41	67.90	61.66	41.47	45.50
Oct	47.83	56.76	70.91	56.50	39.42	46.57
Nov	53.66	58.56	72.75	53.43	38.70	49.34
Dec	57.16	61.03	75.23	53.75	38.75	55.67*
Average	50.28	62.89	63.71	64.31	45.07	47.80*

Drop in COLD TRAP™ and drop your degreasing solvent costs by 40%

The patented COLD TRAP freeboard chiller for vapor degreasers can cut your solvent bill by 40%! It works by sealing your degreaser with a blanket of chilled air that virtually eliminates solvent emissions and helps you meet EPA and OSHA standards.

COLD TRAP has already proven its worth in hundreds of installations using both chlorinated and fluorinated solvents, including Allied Chemical's GENESOLV® Solvents. Now it's available in a special "Drop-In" unit that you can *install yourself* in a day or less at a substantially lower cost than a conventional installation made by factory personnel. COLD TRAP not only saves you at least 40% after you put it in, it saves you 20 to 40% of capital costs *when you put it in!* What's more, its remarkable performance is *guaranteed* by the manufacturer, AutoSonics, Inc.

For all the facts, including details of AutoSonic's full money back guarantee on solvent savings, call or write: Equipment Development Manager, Genesolv Solvent Systems, Allied Chemical, P.O. Box 1139R, Morristown, NJ 07960. (201) 455-4551.

The chemical technology resource

Allied Chemical
An ALLIED Company

™Trademark, AutoSonics Inc.

For Information, Circle 145

NONFERROUS PRICES AND PRODUCTION

U.S. Production of Primary Aluminum

Short tons

	1980	1981	1982	1983
Jan	430,924	444,826	350,548	279,299
Feb	406,396	404,225	310,405	245,601
Mar	434,260	447,655	336,276	273,086
Apr	421,105	431,189	318,619	270,450
May	437,938	441,356	320,897	291,751
June	424,510	419,802	299,914	288,209
July	426,572	425,115	296,986	312,991
Aug	426,054	416,140	287,077	327,051
Sept	418,945	393,012	271,147	328,581
Oct	436,676	395,565	275,277	352,733
Nov	427,394	364,375	266,366	350,000*
Dec	438,929	364,164	275,120	360,000*
Total	5,129,703	4,947,925	3,608,632	3,679,752

Source: Aluminum Association

*IA Estimate

U.S Production of Refined Copper

In tons of 2000 pounds.

	1979	1980	1981	1982	1983
Jan	135,600	161,000	133,500	117,500	97,300
Feb	135,800	149,500	116,300	123,400	100,600
Mar	152,200	162,300	152,200	121,500	131,900
Apr	149,800	170,400	155,800	116,400	125,500
May	154,600	158,700	135,000	107,500	112,200
June	149,400	167,200	158,300	108,600	114,500
July	132,300	52,400	131,700	81,800	73,100
Aug	144,900	28,700	124,000	77,600	90,600
Sept	137,500	27,300	140,500	80,600	91,200
Oct	148,700	61,000	127,300	80,100	110,400
Nov	145,000	85,800	124,900	92,100	94,000*
Dec	33,514	136,900	147,900	90,800	120,000*
Total	1,766,300	1,361,200	1,647,400	1,197,900*	1,261,300*
Average	147,192	113,433	137,283	99,825*	105,108*

Source: ABMS.

*IA Estimate.

U.S Production of Slab Zinc

Short tons

	1979	1980	1981	1982	1983
Jan	45,714	30,511	33,445	26,706	20,010
Feb	46,113	30,613	31,457	23,845	22,766
Mar	52,916	34,777	34,450	23,639	24,994
Apr	51,130	32,123	34,051	21,314	24,709
May	49,870	31,922	32,218	23,656	25,858
June	42,953	28,452	30,828	23,713	23,990
July	44,016	20,774	33,018	20,570	17,645
Aug	41,973	26,703	33,534	22,433	25,601
Sept	39,798	28,613	29,424	26,549	25,064
Oct	46,005	30,990	29,778	27,348	26,532
Nov	43,427	29,884	29,276	20,606*	27,500*
Dec	42,000*	33,247	25,301	19,945*	29,500*
Total	537,427	358,609	376,780	280,326*	294,169*
Average	44,786	29,884	31,398	23,361*	24,514*

Source: ABMS.

*IA Estimate.

U.S Production of Refined Lead

Short tons

	1979	1980	1981	1982	1983
Jan	52,990	56,879	57,984	50,527	57,029
Feb	52,237	49,324	53,569	4[illegible],193	50,943
Mar	60,632	54,058	58,170	43,994	52,825
Apr	52,493	47,493	52,741	36,111	49,938
May	58,065	47,044	35,038	54,323	47,230
June	55,026	47,142	24,378	52,974	42,045
July	52,606	52,037	33,027	44,224	39,525
Aug	49,878	48,173	45,097	46,362	45,283
Sept	45,400	50,158	43,704	49,201	41,226
Oct	52,936	52,156	46,062	50,574	49,972
Nov	54,598	48,438	39,412	[illegible]	44,000*
Dec	54,252	53,456	44,036	48,585	52,000*
Total	641,113	606,35[illegible]	533,238	572,614	572,016*
Average	53,426	50,530	44,437	47,718*	47,668

Source: ABMS.

*IA Estimate.

Aluminum 99.5 Pct Ingot
Cents Per Pound, Freight Allowed

	1972	1973	1974	1975	1976	1977
Jan.	29.00	25.00	29.00	39.00	41.00	48.00
Feb.	29.00	25.00	29.00	39.00	41.00	48.00
Mar.	29.00	25.00	29.24	39.00	41.00	48.00
Apr.	29.00	25.00	31.50	39.00	41.75	51.00
May	27.00	25.00	31.50	39.00	44.00	51.00
June	25.00	25.00	33.40	39.00	44.00	51.00
July	25.00	25.00	33.50	39.00	44.00	53.00
Aug.	25.00	25.00	35.94	41.00	47.00	53.00
Sept.	25.00	25.00	38.70	41.00	48.00	53.00
Oct.	25.00	25.00	39.00	41.00	48.00	53.00
Nov.	25.00	25.00	39.00	41.00	48.00	53.00
Dec.	25.00	27.00	39.00	41.00	48.00	53.00
Average	26.50	25.17	34.00	39.83	44.65	51.25

	1978	1979	1980	1981	1982	1983†
Jan.	53.00	55.25	66.25	76.00	76.00	76.00
Feb.	53.00	58.00	66.25	76.00	76.00	76.00
Mar.	53.00	58.00	66.25	76.00	76.00	76.00
Apr.	53.00	59.50	72.00	76.00	76.00	76.00
May	55.25	59.50	72.00	78.00	76.00	76.00
June	55.25	59.50	72.00	78.00	76.00	76.00
July	55.25	62.75	72.00	78.00	76.00	76.00
Aug.	55.25	62.75	72.00	78.00	76.00	76.00
Sept.	55.25	62.75	72.00	78.00	76.00	76.00
Oct.	55.25	66.25	76.00	78.00	76.00	81.00
Nov.	55.25	66.25	76.00	78.00	76.00	81.00
Dec.	55.25	66.25	76.00	78.00	76.00	81.00
Average	54.50	61.40	71.56	77.33	76.00	77.25†

†Nominal

Electrolytic Copper
Cents Per Pound

	1972	1973	1974	1975	1976	1977
Jan	50.35	53.12	68.70	70.50	63.00	65.20
Feb	50.25	56.12	68.70	63.00	63.00	67.50
Mar	52.63	60.12	68.70	63.00	64.50	70.63
Apr	52.63	60.12	68.70	63.00	68.00	74.00
May	52.63	60.12	81.20	63.00	70.00	72.80
June	52.63	60.12	86.10	62.25	70.00	69.88
July	50.63	60.12	86.30	61.50	74.00	68.75
Aug	50.63	60.12	86.70	63.00	74.00	64.00
Sept	50.63	60.12	83.00	63.00	74.00	60.00
Oct	50.63	60.12	78.25	63.00	72.00	60.00
Nov	50.63	60.12	75.80	63.00	70.00	60.00
Dec	50.63	68.00	73.00	63.00	65.00	61.29
Average	51.24	59.86	77.00	63.44	68.95	66.17

	1978	1979	1980	1981	1982	1983
Jan	62.75	75.63	116.95	88.55	79.54	79.00
Feb	62.25	89.36	134.17	86.01	79.41	82.75
Mar	61.62	97.75	105.97	86.74	76.34	81.13
Apr	64.00	90.50	94.57	88.15	76.87	82.40
May	64.33	89.50	92.91	85.99	78.86	82.81
June	65.23	86.39	92.32	85.11	71.67	80.88
July	63.50	85.95	102.88	83.99	71.64	81.75
Aug	66.47	90.24	101.29	88.32	71.82	79.75
Sept	66.83	92.36	98.78	84.90	71.87	76.75
Oct	69.54	97.72	98.91	83.03	71.94	71.50
Nov	71.20	98.49	96.02	81.93	72.25	68.63*
Dec	71.50	106.10	88.13	80.97	73.12	70.50*
Average	65.77	92.12	101.90	85.31	74.61	78.15*

*IA Estimate

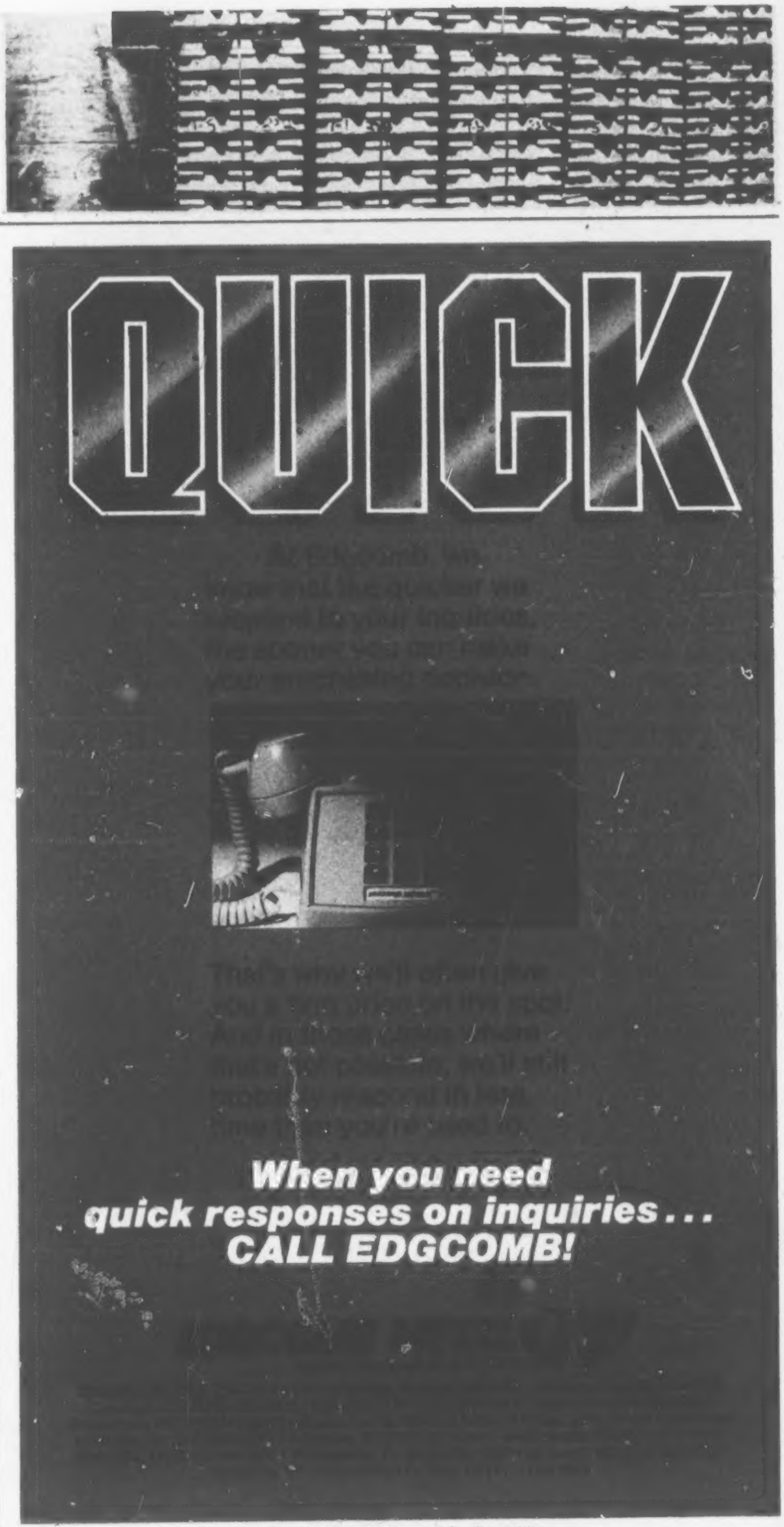
Straits Tin, Spot Price
(cents per pound†)

	1978	1979	1980	1981	1982	1983
Jan.	544.94	624.18	758.95	643.35	695.66	578.82
Feb.	549.69	660.84	785.67	617.29	660.43	584.84
Mar.	514.96	684.35	812.18	607.75	589.40	598.42
Apr.	497.24	678.60	785.72	597.65	570.95	619.66
May	526.96	683.46	784.62	566.09	583.13	612.03
June	555.12	697.82	756.62	569.26	566.40	600.44
July	559.52	699.59	752.61	591.87	561.69	593.28
Aug.	592.37	678.57	751.51	652.76	564.08	583.50
Sept.	627.15	697.18	778.59	675.15	572.26	579.72
Oct.	661.05	714.24	744.38	698.17	556.11	580.58
Nov.	691.11	724.99	697.21	709.45	558.37	583.76*
Dec.	636.69	752.17	655.05	708.72	561.57	582.00*
Average	581.40	691.33	N.A.	636.63	586.75	591.41*

† U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo, beginning June, 1980. Prior prices are C.I.F., New York, based on Penang picul price.

N.A.—Not Applicable

*Estimate



For Information, Circle 146

IRON ORE

Pig Iron, Production

Net Tons

Year	Basic	Bessemer	Low phosphorous	Foundry	Malleable	All Other, incl. Direct Castings Silvery Pig Iron	Pig Iron
1972	83,961,000	1,336,000	105,000	1,533,000	2,186,000	370,000	88,942,000
1973	96,202,000	1,242,000	101,000	1,581,000	1,352,000	359,000	100,837,000
1974	91,193,000	1,100,000	106,000	1,528,000	1,382,000	600,000	95,909,000
1975	75,911,000	1,087,000	140,000	1,321,000	814,000	650,000	79,923,000
1976	82,894,000	1,150,000	112,000	1,489,000	800,000	425,000	86,984,000
1977	78,198,000	254,000	122,000	1,610,000	690,000	454,000	81,328,000
1978	84,497,000	295,000	110,000	1,856,000	471,000	450,000	87,679,000
1979	84,047,000	12,000	178,000	1,457,000	1,003,000	306,000	87,003,000
1980	66,964,000	39,000	72,000	713,000	799,000	134,000	68,721,000
1981	71,166,000	56,000	132,000	1,221,000	929,000	66,000	73,750,000
1982	42,604,000	—	56,000	239,000	377,000	33,000	43,309,000
1983	—	—	—	—	—	—	46,700,000*

*Iron Age estimate.

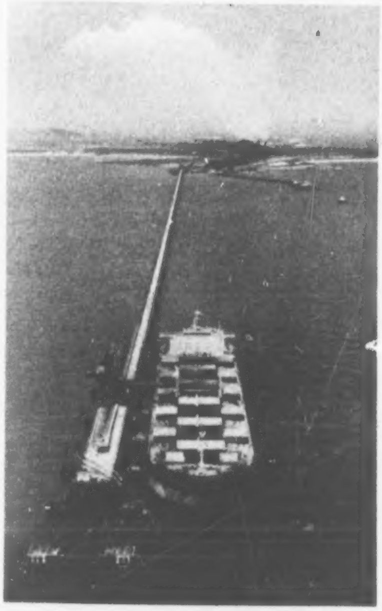
Source American Iron and Steel Institute

Supply of Iron Ore in the United States

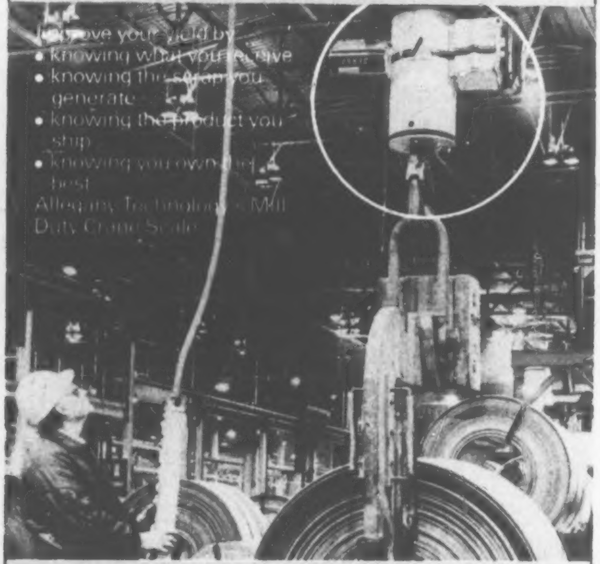
Year	Domestic Shipments	Exports	Imports	Net Supply*
1975	80,267,092	2,537,451	46,742,190	124,471,831
1976	86,646,674	2,997,333	43,933,333	127,582,674
1977	67,050,341	2,143,047	37,904,705	102,811,999
1978	83,207,000	4,213,194	33,616,378	112,610,184
1979	92,053,933	5,147,657	33,776,072	120,682,348
1980	72,628,819	5,689,198	25,058,200	91,997,821
1981	66,302,487	5,545,518	28,333,974	89,090,943
1982	35,864,871	3,177,620	14,715,345	47,402,596
1983**	38,000,000	3,100,000	10,000,000	44,900,000

*Domestic shipments minus exports, plus imports. **Estimate

Source: American Iron Ore Association



YIELD TOOL™

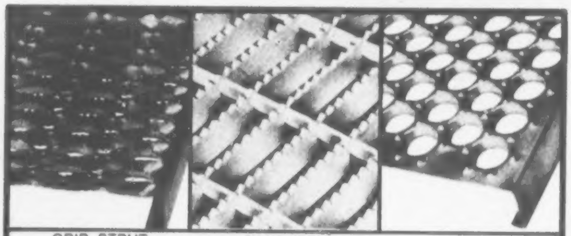

Improve your yield by
• knowing what you receive
• knowing the scrap you generate
• knowing the product you ship
• knowing you own the best
Allegany Technology's Mill Duty Crane Scale

Call toll free: 1-800-638-5111, or in Maryland call: 301-722-7330, for your closest dealer or service representative—or call today for a Yield Tool™ demonstration in your plant.

Allegany Technology, Inc.
Cumberland, Maryland 21502
The standard of the industry in electronic scales.

ALLEGANY TECHNOLOGY INC.

For Information, Circle 147



The Hole Story

Safety Gratings
ALL STYLES
Planks — Walkway — Stair Treads
Galvanized — Aluminum
Carbon Steel — Stainless
FAST CUT-TO-SIZE SERVICE
Same Day Shipment From the Largest Stock
in the 'HOLE' Country
GET THE 'HOLE STORY' ON
PERFORATED METAL + EXPANDED METAL
WIRE CLOTH + BAR GRATING
GRIP STRUT + OPEN GRIP
SAFETY GRATINGS

Call or Write for a New Catalog and Stock List

CLEVELAND • CHICAGO • DALLAS • ATLANTA • TAMPA
McNICHOLS CO.
5501 Gray St. / Tampa, Florida 33609 / 813-876-4100
CALL TOLL FREE
800-237-3820 (In Florida) 800-282-6600

For Information, Circle 148

If you find a wheel that costs less than Bancroft's

DON'T BUY IT!

DISCOUNT PRICES
MULTI-PURPOSE

Every manufacturer of resinoid grinding wheels has already cut prices to the bone. So you can't save money on price alone. If you find lower prices than ours — you may be losing money.

It's performance that counts!

- How consistent are the results?
- How long does a wheel last between changes?
- Does it really perform to your requirements?

Bancroft wheels are highest quality, competitive, cost effective. Ask us to prove it. We'll engineer and provide you with test wheels of the size, shape and cutting characteristics to meet your needs. Send the card or call us collect today.

Bancroft Company, Inc. Abrasive Grinding Wheels Founded 1931
23841 Kean Avenue, Dearborn, MI 48124
(313) 274-2100

For Information, Circle 150

TURBOLASE™ T3000 IS HERE

A compact, new-technology, multi-kilowatt, industrial laser

...that welds with speeds and penetrations of multi-kilowatt lasers costing over twice the price and taking up to double the floor space.

...that cuts with an extremely high beam quality at speeds unobtainable from any other commercially available laser.

The T3000, like our production-proven T1000, uses patented new TURBOLASE technology — a generation ahead, providing "Light Bulb" reliability at a cost per watt of high-quality beam power unmatched in the industry. Put the T3000 to work for you now!

Call or write for more information on the TURBOLASE T3000, the complete TURBOLASE Series, Photon's full line of Industrial CO_2 Lasers, and our 1984 series of one-day seminars on industrial laser applications in your area.

The new TURBOLASE T3000 welds 1/8-inch cold-rolled and stainless steels at 120 inches per minute, cuts 3/8-inch steel at 100 inches per minute, and 1/8-inch aluminum at 80 inches per minute.

1984 Laser Seminars:
Atlanta, Ramada Renaissance, Feb. 1
Chicago, Hyatt O'Hare, Mar. 8
Cleveland, Marriott Inn, Apr. 12

photon
LASERS...THE EDGE OF TOMORROW!
PHOTON SOURCES, INC., 12163 GLOBE RD., LIVONIA, MI 48150 / 313-591-0101

For Information, Circle 151

NONFERROUS PRICES

Lead, Common Grade Price

Cents Per Pound

	1977	1978	1979	1980	1981	1982	1983
Jan	26.50	33.00	40.58	51.29	34.13	29.95	22.40
Feb	28.67	33.00	43.75	50.00	30.68	28.00	21.95
Mar	30.50	33.00	46.00	49.55	35.28	26.00	21.75
Apr	31.00	33.00	48.00	45.45	37.63	26.50	22.00
May	31.00	31.23	49.76	36.00	37.00	26.50	21.55
June	31.00	31.00	57.62	34.25	38.25	25.80	21.20
July	31.00	31.00	58.60	35.77	41.25	27.90	21.15
Aug	31.00	32.40	57.97	40.97	44.63	27.90	21.15
Sept	31.00	34.30	58.60	42.40	42.50	26.75	22.00
Oct	31.00	37.00	60.74	45.00	37.63	26.00	25.50
Nov	32.00	38.00	58.27	44.00	34.46	23.75	26.00*
Dec	33.00	38.00	57.02	39.00	31.86	22.00	26.00*
Average	30.64	33.74	53.06	42.81	37.11	26.42	26.42

*Estimate

Zinc Prices

1971-81 Prime Western
1982—High Grade†
Cents Per Pound

	1972	1973	1974	1975	1976	1977
Jan	17.00	19.50	31.18	39.00	37.68	37.00
Feb	17.00	19.50	31.75	39.00	37.00	37.00
Mar	17.50	19.63	32.70	38.75	37.00	37.00
Apr	17.50	20.38	34.75	38.75	37.00	37.00
May	18.00	20.38	34.75	38.75	37.00	36.40
June	18.50	20.38	35.25	38.75	37.00	34.00
July	18.50	20.38	36.97	38.75	37.00	34.00
Aug	18.50	20.38	38.00	38.75	37.00	34.00
Sept	18.50	20.38	38.95	38.75	37.00	34.00
Oct	18.50	20.38	39.00	38.75	37.00	32.80
Nov	19.50	20.38	39.00	38.75	37.00	31.17
Dec	20.00	30.00	39.00	38.75	37.00	30.50
Average	18.25	20.97	35.94	38.79	37.06	34.57

	1978	1979	1980	1981	1982†	1983
Jan	30.50	35.00	37.50	41.25	42.80	39.50
Feb	30.07	36.89	38.67	41.63	43.00	40.00
Mar	29.00	38.05	38.92	43.63	43.00	38.90
Apr	29.00	38.50	38.50	43.75	35.75	38.25
May	29.00	38.50	37.50	46.50	36.00	40.00
June	29.90	38.57	36.50	46.63	35.80	40.06
July	30.00	39.64	35.50	46.63	38.50	40.90
Aug	31.88	36.81	35.97	49.75	39.50	43.50
Sept	32.75	36.07	36.60	49.75	41.00	46.00
Oct	33.75	37.50	37.50	46.50	41.00	46.80
Nov	34.75	37.08	38.60	46.75	40.20	49.00*
Dec	34.75	37.50	40.50	43.75	38.25	49.00*
Average	31.28	37.51	37.70	45.54	39.55	42.65*

*Estimate.

Electrolytic Nickel

Cents Per Pound, New York, Duty Paid

Oct. 1, 1976 to July 25, 1977	241.00
Published price suspended through Feb. 1, 1979	
Feb. 2, 1979 to Mar. 13, 1979	210.00
Mar. 14, 1979 to April 10, 1979	230.00
April 11, 1979 to May 13, 1979	255.00
May 14, 1979 to June 6, 1979	290.00
June 7, 1979 to Dec. 4, 1979	305.00
Dec. 5, 1979 to Feb. 27, 1980	325.00
Feb. 28, 1980 to Nov. 24, 1981	350.00
Nov. 25, 1981 to	329.00

Source: Inco, Inc.

Reprints available while supply lasts. For single copy, circle No. 96 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4444.

PRICE & PRODUCTION DATA

(Effective December 27, 1983)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	188	189	183	125
Buffalo	8	9	9	29
Pittsburgh	204	225	210	67
Youngstown	95	107	59	43
Cleveland	135	132	138	49
Detroit	125	130	127	82
Chicago	453	519	513	310
Cincinnati	91	90	89	49
St. Louis	58	63	65	25
Southern	162	174	149	44
Western	81	77	69	57
U.S. Production	1,600	1,717	1,611	880

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton $32.78
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective December 27, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,600	1,717	82,075	70,036
Capability Utilization Rate	55.4	59.5	55.6	46.4

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 89.50	$ 87.17	$ 84.50	$ 55.83
No. 2 bundles	$ 58.17	$ 58.17	$ 52.50	$ 39.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 96.50	$ 90.50	$ 88.50	$ 57.50
No. 1 steel, Philadelphia	86.50	86.50	80.50	54.50
No. 1 steel, Chicago	85.50	84.50	84.50	55.50
No. 1 bundles, Detroit	86.50	86.50	81.50	41.50
Low Phos., Youngstown	88.50	88.50	84.50	51.50
No. 1 mach'y cast., Pgh	79.50	79.50	109.50	61.50
No. 1 mach'y cast., Phila	97.50	97.50	95.50	98.50
No. 1 mach'y cast., Chi	113.50	113.50	111.50	104.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective December 27, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	67.00	66.00-67.00	12/20/83
Lead	24.00-27.00	25.00-27.00	12/13/83
Magnesium Ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	49.00	46.00-49.00	10/25/83

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.80-$1.90
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$377.75
Indium, dollars per troy oz.	$3.20
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$325-$340
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.82
Vanadium	$4.94
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Dec. 19—565.12
Dec. 20—566.04
Dec. 21—567.42
Dec. 22—566.44
Dec. 23—566.11

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64½	61
Yellow brass	58⅞	57½
Red brass	60¾	59¼
Comm. bronze	61¼	59¾
Mang. bronze	61¼	58¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	60
No. 2 copper wire	50
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	46
Light copper	38
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	27
Radiators	41

Aluminum

New mixed clips	50	—51
Old sheet	48	—49
Old cast	48	—49
Clean dry borings	48	—49

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	36	—37
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	38	—39
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	10	—11

EFFECTIVE DEC. 27, 1983

(Effective December 27, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 96.00 to $ 97.00
No. 2 hvy. melting	86.00 to 87.00
No. 1 dealer bundles	119.00 to 120.00
No. 1 factory bundles (auto)	122.00 to 123.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	119.00 to 120.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	49.00 to 50.00
Low phos. punchings plate	119.00 to 120.00
Heavy turnings	86.00 to 87.00
No. 1 RR hvy. melting	116.00 to 117.00
Rails 2 ft. and under	121.00 to 122.00
Scrap rails, random lgth.	107.00 to 108.00
RR specialties	115.00 to 116.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	580.00 to 590.00
18-8 turnings	480.00 to 490.00

Chicago

No. 1 hvy. melting	$ 85.00 to $ 86.00
No. 2 hvy. melting	82.00 to 83.00
No. 1 dealer bundles	114.00 to 115.00
No. 1 factory bundles (auto)	113.00 to 114.00
No. 2 dealer bundles	59.00 to 60.00
No. 1 busheling	108.00 to 109.00
Shredder scrap	103.00 to 104.00
Machine shop turn.	39.00 to 40.00
Mixed bor. and turn.	40.00 to 41.00
Shoveling turnings	53.00 to 54.00
Cast iron borings	59.00 to 60.00
Low phos. forge crop	120.00 to 121.00
Low phos. punchings plate ¼ in. and heavier	128.00 to 129.00
Low phos. 2 ft. and under	123.00 to 124.00
No. 1 RR hvy. melting	109.00 to 110.00
Scrap rails, random lgth.	93.00 to 94.00
Reroller rails	108.00 to 109.00
Rails, 2 ft. and under	118.00 to 119.00
RR couplers and knuckles	108.00 to 109.00
RR car axles	124.00 to 125.00
No. 1 machinery cast	113.00 to 114.00
Cupola cast	104.00 to 105.00
Stove plate	104.00 to 105.00
Steel car wheels	115.00 to 116.00
Stainless	
18-8 bundles and solids	560.00 to 570.00
18-8 turnings	460.00 to 470.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 85.00 to $ 88.00
No. 2 hvy. melting	70.00 to 73.00
No. 1 dealer bundles	100.00 to 103.00
No. 2 dealer bundles	54.00 to 57.00
No. 1 busheling	100.00 to 103.00
Shredder scrap	100.00 to 103.00
Machine shop turn.	26.00 to 29.00
Mixed bor. and turn.	26.00 to 29.00
Shoveling turnings	45.00 to 48.00
Low phos. 5 ft. and under	100.00 to 103.00
Low phos. 2 ft. punchings	112.00 to 115.00
Electric furnace bundles	117.00 to 120.00
RR specialties	100.00 to 103.00
Rails, 2 ft. and under	114.00 to 117.00
Cupola cast	67.00 to 70.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	96.00 to 99.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 64.00 to $ 65.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 dealer bundles	86.00 to 87.00
No. 2 bundles	42.00 to 43.00
No. 1 busheling	85.00 to 86.00
Drop forge flashings	60.00 to 61.00
Machine shop turn.	33.00 to 34.00
Mixed borings and turn.	20.00 to 21.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	41.00 to 42.00
Heavy breakable cast	35.00 to 36.00
Mixed cupola cast	51.00 to 52.00
Automobile cast	74.00 to 75.00
Stainless	
18-8 bundles and solids	460.00 to 470.00
18-8 turnings	340.00 to 350.00
430 bundles and solids	125.00 to 135.00

Youngstown

No. 1 hvy. melting	$ 80.00 to $ 83.00
No. 2 hvy. melting	61.00 to 64.00
No. 1 dealer bundles	92.00 to 95.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	87.00 to 90.00
Electric furnace bundles	82.00 to 85.00
Galvanized bundles	76.00 to 79.00

Cleveland

No. 1 hvy. melting	$ 76.00 to $ 79.00
No. 2 hvy. melting	44.00 to 47.00
No. 1 dealer bundles	94.00 to 97.00
No. 1 factory bundles	100.00 to 103.00
No. 2 bundles	23.00 to 26.00
No. 1 busheling	93.00 to 96.00
Machine shop turn.	12.00 to 15.00
Mixed bor. and turn.	12.00 to 15.00
Shoveling turnings	14.00 to 17.00
Cast iron borings	17.00 to 20.00
Cut structural & plates, 2 ft. and under	105.00 to 108.00
Low phos. punchings plate	105.00 to 108.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	112.00 to 115.00
Rails, 18 in. and under	113.00 to 116.00
Steel axle turnings	67.00 to 70.00
Railroad cast	94.00 to 97.00
No. 1 machinery cast	97.00 to 100.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to $ 71.00
No. 2 hvy. melting	53.00 to 55.00
No. 1 busheling	82.00 to 83.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	83.00 to 84.00
Structural and plate, 2 ft. and under	84.00 to 85.00
Rails, 2 ft. and under	95.00 to 96.00
Scrap rails, random lgth.	74.00 to 75.00
No. 1 machinery cast	71.00 to 72.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 77.00 to $ 78.00
No. 2 hvy. melting	66.00 to 67.00
Foundry steel, 2 ft.	66.00 to 67.00
No. 1 dealer bundles	77.00 to 78.00
No. 2 bundles	63.00 to 64.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	38.00 to 39.00
No. 1 RR hvy. melting	87.00 to 88.00
Rails, random length	81.00 to 82.00
Rails, 18 in. and under	97.00 to 98.00
RR specialties	90.00 to 91.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	80.00 to 81.00
Cast iron car wheels	52.00 to 53.00
Rerolling rails	102.00 to 103.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 73.00 to $ 74.00
No. 2 heavy melting	69.00 to 70.00
No. 1 dealer bundles	76.00 to 77.00
No. 2 bundles	55.00 to 56.00
No. 1 busheling	75.00 to 76.00
Shredder scrap	96.00 to 97.00
Machine shop. turn.	27.00 to 28.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	37.00 to 38.00
Electric furnace bundles	69.00 to 70.00
Elec. furnace, 3 ft. & under	76.00 to 77.00
Structural and plate, 2 ft.	101.00 to 102.00
Structural and plate, 4 ft.	94.00 to 95.00
No. 1 RR hvy. melting	94.00 to 95.00
Scrap rails, random lgth.	88.00 to 89.00
Rails, 18 in. and under	103.00 to 104.00
Angles and splice bars	95.00 to 96.00
No. 1 cupola cast	90.00 to 91.00
Unstripped motor blocks	69.00 to 70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to $ 71.00
No. 2 hvy. melting	64.00 to 65.00
No. 1 dealer bundles	81.00 to 82.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	22.00 to 23.00
Low phos. 18 in. and under	102.00 to 103.00
Rails, random length	81.00 to 82.00
Rails, 2 ft. and under	97.00 to 98.00
No. 1 cupola cast	73.00 to 74.00
Heavy breakable cast	36.00 to 37.00
Drop broken cast	88.00 to 89.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 46.00 to $ 47.00
No. 2 hvy. melting	40.00 to 41.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	490.00 to 510.00
18-8 turnings	390.00 to 410.00
430 prepared solids	80.00 to 100.00
410 solids	70.00 to 80.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 62.00 to $ 64.00
No. 2 hvy. melting	52.00 to 54.00
No. 1 dealer bundles	76.00 to 78.00
No. 2 bundles	40.00 to 42.00
No. 1 busheling	80.00 to 82.00
Shredder scrap	78.00 to 80.00
Machine shop turn.	12.00 to 14.00
Shoveling turnings	18.00 to 20.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	47.00 to 49.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 46.00 to $ 48.00
No. 2 hvy. melting	37.00 to 39.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 dealer bundles	15.00 to 18.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	73.00 to 75.00

Los Angeles

No. 1 hvy. melting	$ 48.00 to $ 50.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 dealer bundles	37.00 to 39.00
No. 2 dealer bundles	15.00 to 18.00
Machine shop turn.	6.00 to 8.00
Shoveling turnings	10.00 to 12.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	75.00 to 77.00
No. 1 cupola cast	75.00 to 77.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	40.00 to 42.00
No. 1 cupola cast	96.00 to 98.00
Mixed yard cast	83.00 to 85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 65.00
No. 2 heavy melting cut 2 ft. and under	62.00
No. 1 dealer bundles	70.00
No. 2 bundles	38.00
Mixed steel scrap	44.00
Bush. new fact. prep'd.	68.00
Bush. new fact. unprp'd.	60.00
Machine shop turn.	33.00
Short steel turn.	36.00
Mixed bor. and turn.	23.00
Cast scrap	58.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 82.00 to $ 83.00
No. 2 hvy. melting	66.00 to 67.00
No. 2 bundles	41.00 to 43.00
Machine shop turn.	22.00 to 23.00
Crushed turnings	44.00 to 46.00
Shredder scrap	82.00 to 83.00
Cut structural plate 2 ft. and under	94.00 to 96.00
Unstripped motor blocks	57.00 to 59.00
Cupola cast	80.00 to 82.00

CHILTON'S
January 16, 1984

IRONAGE
METALS PRODUCER

INTERNATIONAL
EDITION

CA014CCNGRES---00 SCF
0 JUN88
CONGRESSIONAL INFO SERV
SKT ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

GALVANIZED STEEL: DETROIT GETS AN EARFUL FROM PITTSBURGH

IN PLANT SPOTLIGHT: J&L'S NEW CASTER

THE HOT SPOT: MERGERS IN STEEL

Plus

WORLD METALPRODUCING/ MANUFACTURING OUTLOOK: A COUNTRY BY COUNTRY ANALYSIS

JANUARY 16, 1984 VOL. 227, NO. 2

CHILTON'S
IRON AGE
METALS PRODUCER

Photo by James W. Conroy

Editorial 7
Well, I wouldn't bet against it.

You and Your Job 19
Top executives examine their climb up the ladder.

Newswatch 23
Micro-mills could be the steel industry's moveable feast.

Order Trends 30
Defense spending rose, but nondefense outlays declined.

Hot Spot 33
Are mergers the right route for the American steel industry?

Metalproducing Outlook 38
A look at the world steel industry's hopes for 1984.

U. S. Steel 49
More shutdowns at the big steelmaker.

Galvanizing 55
A capacity push in galvanized sheet is underway.

In-Plant Spotlight 60
J&L's new casters rolled out early.

Management Challenge 66
Raising capital: Shop around for the best deal.

Materials Report 86
Steel demand in the U.S. continues at an upward pace.

Business Forecast 92
U.S. manufacturers to boost shipments in 1984.

Next Issue: World Rod and Wire Report

Departments

EDITORIAL STAFF 11
SIGNED, SEALED AND DELIVERED 13
INDUSTRIAL BRIEFS 21
PERSONNEL TOUCH 65
PRODUCT & EQUIPMENT REVIEW 75
BUSINESS STAFF 82
AD INDEX 82
MANAGEMENT SERVICE CARD 83
FREE LITERATURE 85
P&P DATA 1/9/84 88
FERROUS SCRAP 1/9/84 89
CLEARING HOUSE 90

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

Chilton

COMPUTER COURSES ADVANCE CAREERS

More executives concur that computer courses are vital in helping them climb the corporate ladder.

This was contained in the 13th annual survey of management succession, conducted by professors from the University of Michigan's Graduate School of Business Administration.

Their report, "The Newly Promoted Executive: A Study in Corporate Leadership" showed that computer education has risen from seventh place in 1980-81 survey to fourth place in the most recent survey.

However, this year's survey, which polled 1,459 newly promoted executives, showed little shifts from survey results of 1982 in terms of which routes are best to follow if you hope to succeed in business.

For instance, the areas of general management/administration and marketing/sales continue to be the fastest routes to the top.

And as last year, a majority of new executives reported that *personal challenge* spurred their ascent, and also mentioned such influences as normal career advancement, importance of the job, monetary considerations, prestige and recognition.

Again, the 1983 poll showed that a high percent of promotions where internal. And, although most were among males, distaffers continue to join the higher corporate ranks.

Corporate business leadership continues to be financially rewarding.

As proof, major promotions earned executives an average salary increase of 20 pct in the 1982-83 period, bringing the median to a new high of $120,039.

Last year the average increase stood at 16.7 pct. The maximum base salary reported in this latest poll was $500,000.

As indicated in last year's survey, most executives rise through the ranks of finance and accounting, marketing and sales, production and operations, with most (57.8 pct) grouped in general management.

Finally, most respondents are holding to their views that drive and ambition motivate business success, while fortutious circumstances took a backseat compared to education and abilities in determining who went how far.

Body language can be louder than words

"Up to 80 pct of our communication is nonverbal," asserted anthropologist Edwin Hall, author of "Beyond Culture."

As reported in the December, 1983 issue of *Bechtel News*, Dr. Hall along with Harvard University psychologist Dr. Daniel Coleman and Dr. Dane Archer, a University of California/Santa Cruz sociologist, have stressed the importance of body language and agree that most people possess strong interpretive powers.

In the same report, behaviorial consultant Maxine Fiel has outlined some general elements of the body's silent vocabulary.

For instance, take hands.

Placed on the hips they may convey a provocative or tough position, but placed on the desk they should mean business. If they're jammed in the pockets they might be interpreted as meaning detachment or withdrawal.

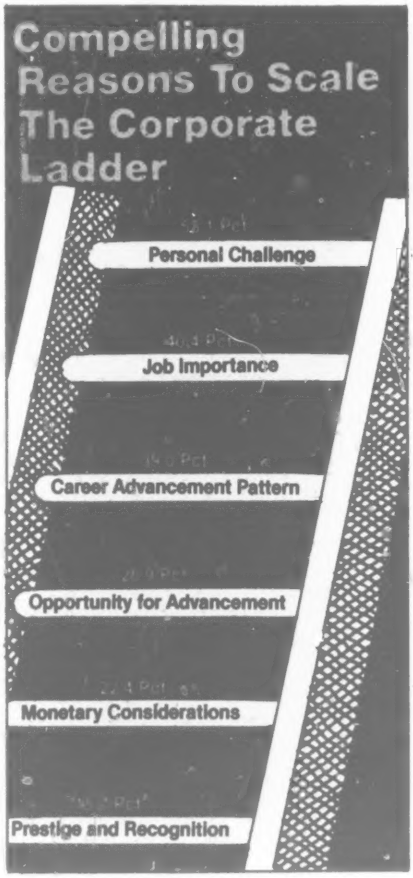
Crossing gestures, of hands and legs, may mean closing another out, either emotionally or intellectually.

"*Eyes* seldom lie—in fact, some lie detector devices operate on the basis of eye movement and pupil dilation," the report continued.

Also, Dr. Coleman believes that eye movements can reveal sentiments and eye contact indicates self-assurance and security; lack of it may suggest timidity or dishonesty.

Finally, Ms. Fiel is reported as noting that body mannerisms, *silent dialogue*, can fill the gap when there is a lack of verbal expression.

Computer education has risen from seventh place . . . to fourth place in the most recent survey.



BY PATRICIA AIMAN

DURABLE ORDERS GIVE MIXED SIGNALS

Mixed signals about the strength of the economy emerged from November's durable goods orders report.

A big jump in orders for military goods helped push total orders up 2.2 pct, but military purchases are volatile from month-to-month and cannot be counted on for growth continuity.

Orders for nondefense capital goods—an indicator of the trend of business spending—dropped 4.9 pct during November from October.

Overall orders received in the eleventh month came to $96.7 billion, exceeding October's $93.6 billion by 3.2 pct. The November total was substantially better than the 1982 figure of $70.5 billion.

The increase in manufacturers new orders resulted mostly from gains in the durable goods sector. New orders for transportation equipment increased by $3.7 billion, or 17.3 pct, to $24.9 billion, with much of the increase reflecting large defense orders.

New orders for machinery dropped 6.0 pct, the first major decline since last January.

There was no change in the overall total of new orders for metalworking machinery, but there were dramatic drops in the individual categories.

The 2.6 pct increase in manufactured goods shipments was almost all attributable to the durable goods industries. Every major industry except instruments show significant gains.

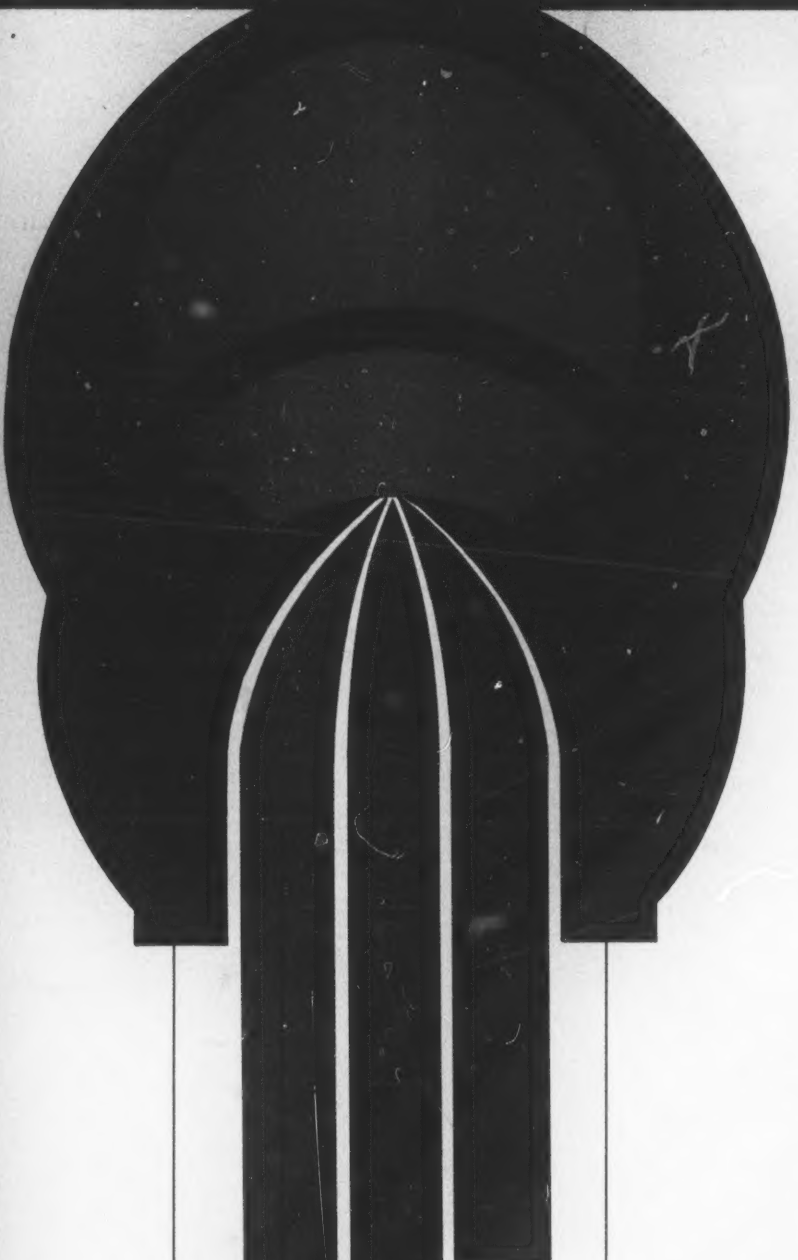
Factory inventories showed no significant change in November. This indicates that manufacturers are striving to control costs by keeping inventories low. The inventory to shipments ratio was set at 1.44, less than the 1.48 figure logged in October.

Economists called the drop in nonmilitary capital goods orders "disappointing," but said a one-month decline was not particularly worrisome.

Overall, analysts will continue to watch capital goods orders as an indicator of the current expansion.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted Source: U.S. Dept. of Commerce		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	3rd Qtr.	$313.0	$293.4	$313.7
Manufacturing, Total	3rd Qtr.	117.4	108.7	118.2
Manufacturing, Durable Goods	3rd Qtr.	53.0	48.4	56.6
Mining Industry	3rd Qtr.	13.2	10.9	14.5
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Nov.	96.7	93.6	70.5
Shipments	Nov.	92.4	88.2	72.6
Inventories	Nov.	171.0	170.6	179.4
Unfilled Orders	Nov.	321.4	317.1	281.8
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Nov.	24.7	26.0	20.2
Capital Goods Producers, Defense Industries	Nov.	7.9	5.5	4.8
Primary Metals, Total	Nov.	11.7	10.9	7.4
Steel (SIC 331)	Nov.	4.5	4.7	3.0
Iron & Steel Castings (SIC 332)	Nov.	1.3	1.2	0.7
Nonferrous Metals	Nov.	5.9	5.0	3.7
Nonelectrical Mach.-Equip. Industries, Total	Nov.	16.1	17.5	12.9
Engines & Turbines	Nov.	1.2	1.4	0.9
Farm Machinery & Equipment (Shipments)	Nov.	1.1	1.0	1.0
Construction, Mining & Mat. Hdlg. Equip.	Nov.	2.7	2.5	2.4
General Industrial Machinery	Nov.	1.2	1.5	1.0
Fluid Power Equipment** (Index-1972=100)	Nov.	289.0	274.0	158.0
Metalworking Machinery	Nov.	0.7	0.7	0.5
Machine Tools, Total ($ Mill., Unadjusted)***	Nov.	160.2	202.5	88.2
Machine Tools, Metalcutting***	Nov.	115.3	129.4	62.7
Machine Tools, Metalforming***	Nov.	44.9	73.1	25.4
Electrical Mach. & Equip. Industries, Total	Nov.	14.5	15.0	12.0
Elec. Transmission Equip. Ind. Apparatus	Nov.	1.8	1.8	1.8
Household Appliances	Nov.	1.3	1.2	1.0
Communication Equipment	Nov.	4.7	4.5	4.1
Transportation Equip. Industrial, Total	Nov.	24.8	21.1	14.4
Motor Vehicles & Parts (Shipments)	Nov.	14.3	12.9	8.0
Aircraft, Missiles & Parts	Nov.	7.7	6.8	5.1
Shipbuilding & Military Tanks	Nov.	1.8	0.3	0.8
Fabricated Metal Products, Total	Nov.	11.0	10.5	8.3
Instruments, Total	Nov.	4.2	4.2	3.7

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA



A COUNTRY-

United States

The U.S. steelmaking industry has suffered through two disastrous years that have brought changes to the industry. It will never return to the old ways because none of the old customs, practices and precepts are intact today.

During 1982 and 1983, domestic shipments averaged less than 65 million tons per year. During the seventies, the industry averaged 94 million tons per year!

Translated into dollar costs, the steel makers lost an estimated $5 billion during the two-year period. The industry responded with mergers and plant closings,and the increased use of imported steel by domestic producers. In effect, the industry contracted. Since 1977, 25 million tons of integrated steelmaking capacity has been shut down.

The market opened up for the developing and developed nations which sent its surplus steel to the U.S. markets. In September 1983, the tonnage from the developing nations alone almost equaled the combined tonnage of European and Japanese shipments to the U.S.

In the current economic cycle, the steel market is at a level about 20 million tons below the levels of past cycles. In the 1975 recession, domestic mills shipped 80 million tons. But in the 1982 recession, they shipped only 61 million tons.

Analysts view this as an erosion of the U.S. market, though some insist that the situation is unique.

With this in mind, steel shipments are estimated to rise from 1983's 67 million tons to about 77 million tons in 1984.

Raw steel capacity at the start of 1983 was 151.2 million tons, with a shipping capacity of well over 100 million tons. With a possible shortage of coke beyond 80 million tons, there are indications of more trouble ahead for the U.S. steel makers.

BY-COUNTRY ANALYSIS

JAPAN

The steel industry in Japan is seeing some signs of better days ahead but, nevertheless, the general outlook for the industry remains bleak. They just cannot regain the profitable 100-million ton annual level of crude steel production that they enjoyed in the past. For the foreseeable future, crude steel production seems to be hovering around the 96.5 million ton per year level.

Steel exports account for much of the optimism, with fiscal 1982 (April 1982-March 1983) shipments estimated at 31 million tons. China is importing 6.5 million tons of Japanese steel and the U.S. economy is recovering at a rapid pace. Export shipments to the U.S. exceeded 500,000 tons in September 1983, the first time to do so on a monthly basis since March 1982.

Faltering domestic demand, a levelling off in demand for automobiles and machinery, and increasing competition from the developing nations are hampering the future growth of Japan's steel industry.

Domestic consumption of steel in Japan has been relatively dismal. In fiscal 1982 the steelmakers received orders for 69.8 million tons of ordinary steel. Of this, 47.1 million tons was for domestic use and exports accounted for 22.8 million tons. By comparison, domestic consumption in 1973 was 64.1 million tons, then it dropped to 51.6 million tons in 1974 and to 44.8 million tons in fiscal 1977.

Falling steel prices along with the decline in demand, of course, are contributing to the profitless operations. Recent prices quoted have dipped below $400 per ton, down considerably from a recent yearly average of $466 per ton.

In order to cope with the stagnant trend of the steel industry in Japan, the steelmakers are both diversifying, to reduce their dependence upon steel, and modernizing, to improve efficiency.

In the first half of 1983, production of hot rolled products was 43.23 million tons, down 7.9 pct from the same period in 1982 and down 1.8 pct from the previous six months. Of this, hot rolled special steel products accounted for 6.44 million tons, a decrease of 12.1 pct over the previous six months.

The JISF said that, in terms of orders received from consumers of ordinary steel products, domestic demand in the first half of 1983 declined by 10.4 pct from the same period in 1982. None of the consumers placed increased orders, a confirmation of the slowdown in demand. However, imports of ordinary steel products in the first half of 1983 rose to 1.12 million tons, an increase of 17.2 pct over the same period in 1982. In particular, plates and wide strips accounted for 440,000 tons (up 15.7 pct) and 520,000 tons (up 27.2 pct) respectively, to gain a larger share of the domestic market.

Based on the Ministry of International Trade and Industry (MITI) forecasts, crude steel output in the second half of 1983 is predicted to increase for two consecutive quarters to 24.25 million tons. In terms of domestic demand by consumers, demand from construction is expected to increase as will the demand from the manufacturing industries.

South Korea

Though the iron and steel industry in South Korea is relatively new, as industries go, it is able to meet domestic demand and still export 40 pct of its output.

In 1982 its capacity was 203,000 tons per year. In 1982, it achieved 12.4 million tons per year. The driving force behind this amazing growth has been the demand for steel in South Korea which has increased at a rate over 20 pct per year since 1970.

In 1982, the nation's largest, state-run, integrated steelworks, the Pohang Iron and Steel Company (POSCO),

CRUDE STEEL PRODUCTION

UNITED STATES
Millions of Tons

[illegible]

*Estimate
Source: AISI

JAPAN
Millions of Tons

'80	111.4
'81	101.7
'82	99.5
'83*	95.0
'84*	96.5

*Estimate
Source: International Iron & Steel Institute

SOUTH KOREA
Millions of Tons

'80	9.3
'81	10.8
'82	12.1
'83*	12.0
'84*	12.0

*Estimate
Source: Korean Iron and Steel Federation

ranked 11th among the world's Top 50 steel makers.

The major steelmaking facilities in South Korea essentially consist of POSCO and fifteen other mills. At the end of 1981, South Korea was able to produce 8 million tons of iron, 12.4 million tons of steel and 13.1 million tons of rolled steel.

Exports, which totalled 201,000 tons in 1971, were an astounding 4.5 million tons in 1982.

The Korea Development Institute forecasts domestic demand increasing to 12.4 million tons of crude steel by 1986 and 19.1 million tons by 1991, based on a 9.4 pct annual growth rate.

Domestic demand for rolled steel products is predicted to rise to 11.6 million tons by 1986 and to 18 million tons by 1991, which is a slightly faster rate than that for crude steel. Domestic demand and forged steel products are forecast to increase to 1.3 million tons in 1986 and to 2.2 million tons in 1991.

To cover the anticipated demand, the South Korean government is planning a second integrated iron and steel mill at Kwangyang that will have a crude steel production capacity on 2.7 million tons per year.Construction is to start in 1985 and be completed in September 1988.

France

During 1984, the French government may be forced to abandon its ambitious 1982 "Plan Ancier" of raising steel production to 24 million tons per year by 1986. Crude steel output for 1983 is estimated to be only just 17 million tons compared with 18.403 million tons in 1982 and 21.245 million tons in 1981. Experts' estimates for 1984-1986 vary between 16 and 20 million tons per year.

Shipments for the first half of 1983 were averaging 1.074 million tons per month, against 1.127 million tons per month. Based on this estimate, shipments will be around 12.9 million tons in 1983 against 1982's figure of 13.526 million tons.

Special steels continue to be supported by the good performance of the automobile industry. But truck production tumbled from the 1980 figure of 61,400 units to 39,800 units in 1983. Estimate of 1984 production is 42,500 units. The fall in light commercial vehicle production is less pronounced: 319,500 units are estimated for 1983 against 1980's figure of 375,500 units. But 1984 looks less rosy for light commercials as France is likely to be the: "Weakest market in Europe for trucks and light commercials," forecasts DRI Europe consultancy group. Its production figure estimated for 1984 is 292,000 light commercial vehicles.

In forecasting steel production, the French government, at time of writing, had not abandoned its "Plan Ancier", despite 1982 state steel company losses of nearly 9 billion French Francs. Losses in 1983 will probably be about 8-9 billion Francs. These losses will have consumed the 1983 capital endowments of 6 billion Francs. A steel industry union leader says: "At this rate we will still be in loss (situation) in 1986 with an even older steel sector."

Italy

"No real changes in 1984," said Italian steelmakers. The Italian Steel Federation (ASSIDER) estimates crude steel production for 1983 at around 17.5 million tons, and adds that 1984 is: "Anyone's guess." Crude steel production could be around 17.5 million tons.

In 1980, Italian producers delivered 21.628 million tons compared with 18.317 million tons in 1982 and an estimated 16.639 million tons in 1983. The latter is based on a monthly output average of 1.386 million tons for the first five months of 1983.

Average monthly output in 1982 was 1.526 million tons. Special steels declined steadily from an average monthly output of 310,000 tons in 1980 to 270,000 tons in 1982 and an estimated 232,000 tons in 1983, (based on figures for the first five months of 1983).

Italy was hit hard by the stainless steel recession during 1982. Compared with an average EEC decline of 12 pct, Italy's stainless steel production slumped by 24 pct in 1982. The January-June 1983 period saw stainless steel production down 19 pct to 88,000 tons compared with 108,667 tons in the same 1982 period.

Surprisingly, exports showed a 5 pct increase to 30,976 tons when compared with the same six-month period's performance of 29,481 tons in 1982.

Tube and flat products are expected to decline in 1984. Deliveries of tube are estimated at 1 million tons in 1983.

Both state-owned and privately-owned sectors were hurt by the recession. One state-owned plant spokesman said: "Our biggest plant is hit by the high cost of the U.S. dollar, low market prices and our own low productivity (estimated at 6-7 man-hr/ton steel compared with an EEC average of 4.5). We expect demand to stagnate during the next three years."

"What we need are some national investment projects to generate steel demand, particularly to modernize power generation," commented many producers. There is such a project — "Piano Energetica Nazionale" N -approved by the Italian Parliament in principle. It would involve Lire 93,000 billion investment of which Lire 15,000 billion would involve new power station construction.

Crude Steel Production—Millions of Tons

		Italy	Great Britain	Spain	
1980		XX	11.3	12.6	
1981		24.7	15.3	12.9	
1982		24.0	13.7	13.1	
*1983		17.5	14.0	12.8	
*1984		17.0	14.3	11.0	

*Estimates—first 9-10 months of 1984

Great Britain

After undergoing massive surgery in the state-owned privately-owned sectors, the British steel industry looks like it might match 1983's performance during 1984.

Shipments are anticipated to exceed 12 million tons during 1983 and might even improve by 2-5 pct during 1984. Crude steel production may exceed 14 million tons during 1983.

Commenting on 1984, the state sector spokesman said, "We are exceedingly wary of looking more than a few months ahead. Recovery, is tenuous and there is no sign yet of any sustained increase in demand."

Special steels, as well as castings, are on the critical list. Special steels, primarily from EEC members and other Europeans, pushed up British imports of high speed steel, tool steel and stainless steel bars from 1970's figure of 6,400 tons to around 30,000 tons in 1982.

British producers' deliveries declined, during the same period, from 69,000 to under 20,000 tons. For example, in 1982, imports of high speed steel bar accounted for 74 pct of the British market.

It comes as no surprise that the remaining private special steels producers are lobbying the EEC Commission for production quotas on special steels to be applied under Article 58.

The latter half of 1983 saw more rationalization of seamless tube production and the further merging of state and private interests. The welded tube operation is also being rationalized.

A brighter outlook can be found in the rod, wire and coated sheet sectors. One producer of wire and cold-rolled strip says: "We are attacking imports by improving our own efficiency. We expect to be in profit in 1983, and the momentum will continue."

Spain and Portugal

Until 1983, Spain and Portugal had been increasing steel output. The European steel crisis halted this meteoric rise. Spanish crude steel output in 1982 was over 13 million tons, compared with just 5 million tons in 1969. The Portuguese steel industry will probably return to its 1981 output level of around 650,000 tons per year in 1984 after a slip to 524,000 tons per year during 1983.

The bright spots in the Spanish steel industry include a new special steels export market—spring steel—to China. In the first eight months of 1983, nearly one million tons of round bars were exported to North Africa, the Middle East and the U.S.S.R. Total for 1983 should top 1.4 million tons, says a producer. Spain's share of the West German rebar market could expand in 1984, he said. "We estimate West Germany's consumption of our products could rise to 1.74 million tons in 1983 and more in 1984, against 1.2 million tons in 1982."

Ensidesa estimates its 30 pct export is unhealthy and plans to reduce this by 15-20 pct by 1987.

Portugal is regarded by some as the "Developing country in Europe." It operates one steel plant producing, currently, some 600,000 tons of long products, including 152,000 tons of flat products per year. Production has steadily risen from 519,000 tons of long products in 1979. The production of flat products, meanwhile, has dropped.

Apparently, the development of machine tools and support industries in Portugal is not rapid enough for industry's needs, says an industry spokesman. Portugal has a firm manufacturing base in electrical machines, turbines, textile machinery, iron and aluminum foundries.

Comecon

The six Comecon countries produced about 56.33 million tons of crude steel in 1982. Estimates for 1983 vary between 57-58 million tons. But these figures are below 1979's output of 60.357 million tons.

The drop in production is largely explained by the Polish crisis. Polish steel production dropped from a high of 19.485 million tons in 1981 to 14.795 million tons in 1982. No estimate is available for 1983, except it should have improved.

During this five-year period, steel production rose in Czechoslovakia, the German Democratic Republic (GDR) and Bulgaria, and stabilized in Romania. Some expansion of capacity is planned, especially in Romania, Bulgaria and the GDR.

A realistic prediction, says one country, is an increase of around 11 million tons by 1985. Another says that surplus capacity won't be created as the total USSR-plus-Comecon steel consumption is anticipated to rise to 220 million tons by 1985, compared with 210 million tons in 1980. The equivalent crude steel production in 1980 for the USSR-plus-Comecon block was 209.2 million tons and is anticipated to be 220 million tons by 1985.

The largest Comecon steel producer is currently Czechoslovakia, which overtook Poland in 1982. Crude steel output from Czechoslovakia was then 15.032 million tons compared with 14.795 million tons from Poland. Czech steel production averaged 1.252 million tons per month in 1982. During the first quarter of 1983, 3.863 million tons were produced, averaging 1.288 million tons per month. From this, an estimate for Czech steel production in 1983 is 15.45 million tons. No comparable figures are available from Polish sources.

Crude Steel Production—Millions of Tons

Czechoslovakia	Poland	[illegible]	[illegible]	Hungary	[illegible]	
14.9	19.4	13.1	[illegible]	3.7	[illegible]	1980
15.2	15.7	13.0	[illegible]	3.6	[illegible]	1981
15.0	14.7	13.0	[illegible]	3.7	[illegible]	1982
15.4	15.5	13.1	[illegible]	3.8	[illegible]	1983*
15.7	16.5	13.3	[illegible]	3.9	[illegible]	1984*

*Estimates—first 9-10 months of 1984

U.S.S.R.

Steel production in the USSR slid marginally from its 1979 high of 149.1 million tons to 147.15 million tons in 1982. But an estimate for 1983 indicates production will be back at the 1979 level at the end of 1983.

Based on the Soviet steel industry's performance for the first six months of 1983, output by June was 74.482 million tons. But relatively little is exported from the USSR. Estimates by the International Iron & Steel Institute (IISI) for finished rolled products in 1982 put the figure at around 5.65 million tons.

If one takes 1982's crude steel output, and an estimate for 1983's output, the Soviet steel industry appears to be behind in meeting its commitments for the current 1980-85 Five Year Plan. The Plan called for the output of finished rolled steel to rise from its 1980 figure of 103 million tons to 117-120 million tons in 1985—an increase of 14-17 pct. However, the Soviets are striving to improve yields in the steel plants and raise product quality.

Quality and efficiency problems stem from the steel processing plants, where over 50 pct of Soviet steel is produced by the open-hearth process. In the main, these plants cannot be converted to the conventional top-blown oxygen convertors without the costly rebuilding of melting shop structures. Undergoing trials is a compact bottom-blown oxygen/fuel convertor for producing a wide range of alloy steels, including electrical steels. Also underway is a program for introducing more continuous casting.

In rolling mill development, the USSR aims to reduce its imports of line pipe from the West. For example, in 1982, line pipe imports increased by 38 pct over 1981 to 2.2 million roubles ($2.8 million), principally from Western Europe and Japan. The Zhdanov plate mill came on-stream in July 1983. It has a capacity of 250,000 tons per year of plate for use in fabricating large diameter pipe.

Scandinavia

Scandinavian steel producers rely heavily on exports to the EEC countries and the U.S.

For Scandinavia, 1984 could be a year of concern as the trend towards more import controls increases.

Swedish crude steel production rose steadily, after the low figure of 3.7 million tons output in 1981. Shipments were higher than is normal for Western Europe, with special steels accounting for 60 pct of Swedish output. The total value of finished steels delivered in 1982 was 15 billion Swedish Crowns.

Since 1981, Sweden has been a net exporter of steels. Of the 1981 finished steel shipments tonnage of 3.09 million tons, 1.92 million tons were exported. Imported steel amounted to 1.76 million tons. The shipments of finished steels in 1982 were 8 pct up at 3.06 million tons when compared with 1981. Shipments in 1983 may reach 3.4 million tons.

Trends during the first three-quarters of 1983 showed a 0.2 pct rise in special and stainless steels, while tubes declined by 15 pct. Stainless steel tonnage produced was up by 2.6 pct in the same period, while other alloys were down. In 1982, stainless steel accounted for some 39 pct of the 520,000 tons of special steel exports of hot and cold rolled plate, sheets and tubes.
strength steels."

Sweden's leading steel customers during 1982 were West Germany, U.S. and Britain.

Finland is the second largest Scandinavian steel producer. Its crude steel output stabilized at the 2.4 to 2.5 million ton level during the past five years. Output is expected to remain unchanged during 1984. The Finnish government says that slight growth is expected in the metals and engineering sectors during 1984. The shrinkage of exports to the Comecon countries and the USSR will be balanced by the recovery of exports to the Western countries. Shipments of rolled steel products remained at the 1.8 million ton level during 1979-1982 and are estimated to be 1.9 million tons for 1983 and 1984.

West Germany

For 1983, the steel production industry estimates a 2 pct decline of production tonnage in Europe. According to a statement by the Deustscher Stahbau-Verband in Cologne, 1984 will most probably be the period of stagnation.

During the annual meeting of the European Convention for Steel Construction (EKS) in mid-September 1983 in Munich, W. Germany, Dipl.-Ing. Hans-Jurgen Dankert, President of the EKS, characterized the situation of this industry as being harsh.

The years 1979 to 1980 showed a steady 5 pct annual increase in steel production business. As of 1981 (-2.4 pct) production figures decreased and fell by another 5 pct in 1982. Another, but less severe decline is expected to be recorded for 1983.

The earliest point of recovery might be in the course of 1984 as this industry hopes to be dragged along with the general revitalization of the economy and may thus enjoy positive growth rates again.

The EKS President indicated reasons for optimism: Increasing raw material shortage will continue to favor constructional materials, mainly steel which can be recycled, and the constantly changing market conditions that require tremendous adaptation processes in many European industrial branches.

Crude Steel Production

	[illegible]	Sweden	Finland	Norway	Denmark	[illegible]	Austria	[illegible]
'80	147.9	4.237	2.5	.86	—	[illegible]	3.1	2.2
'81	148.5	3.770	2.4	.84	.6	[illegible]	3.0	2.4
'82	[illegible]	3.900	2.4	.76	.5	[illegible]	2.6	2.2
Est.) '83	149.0	4.100	2.4	.77	.4	[illegible]	n.n	n.n.
Est.) '84	150.0	4.300	2.4	.78	.4	[illegible]	n.n.	n.n.

Benelux

Traditionally Europe's fourth largest steel-producing area following West Germany, Italy, and France, the Benelux countries' crude steel production fell 20 pct from 21.54 million tons in 1981 to an estimated 17.38 million tons in 1983.

The Benelux countries, Belgium, the Netherlands and Luxembourg, only consume about 20 pct of their production. Belgium normally produces about 12 million tons of crude steel per year, and is Europe's fifth largest producer after West Germany, Italy, France and Britain.

The Netherlands' production of crude steel was an estimated 4.3 million tons in 1983 (based on an average of 365,000 tons/month over the first nine months of 1983) compared with 4.354 million tons in 1982. Helping to justify this output was a well-maintained level of industrial exports and a flourishing, if small-scale, automotive industry.

Dutch steel deliveries of carbon steels ran at 175,000 tons per week average during the first five months of 1983—indicating an annual figure of 2.1 million compared with 2.246 in 1982.

Belgium's crude steel production fell from 12.2 million tons in 1981 to 9.89 million in 1982, but appears it may stay at around 9.8 million tons for 1983.

Luxembourg's crude steel output decline is less marked: from 3.79 million tons in 1981, it fell to 3.5 million tons in 1982 and may hold around 3.1 million in 1983. No producer will commit itself to any accurate forecast for 1984. Such a forecast depends on the outcome of various negotiations, coupled with the EEC Commission's demands regarding capacity and production cuts.

Eastern Europe

Eastern Europe—Yugoslavia, Greece and Turkey—has steadily increased crude steel output from 6.74 million tons in 1979 to an estimated 8.55 million tons in 1983.

Yugoslavia's steel output is estimated to just pass the 4.1 million tons level in 1983, compared with 3.53 million tons in 1979. Even so, domestic consumption is at the 6 million tons level.

Under build is a $625 million cold rolling mill complex at Smederevo near Belgrade. This plant reflects the general Yugoslav trend. The recession has hit domestic demand for hot-rolled products, such as reinforcing bars, but more cold-rolled products are in demand for the automotive and domestic appliance industries.

The level of industrial production in Yugoslavia only rose 0.6 pct in the first ten months of 1983. Stagnation existed until July, when new Western government credits financed imports of raw materials and components. Some $400 million of credits remain to be spent in 1984. Consequently, industrial production is picking up.

Turkish crude steel output has also risen steadily from 2.39 million tons in 1979 to an estimated 3.468 million tons for 1983.

In recent years, Turkey has been forced to export steel, with Iran and Iraq, Africa and Malaysia its largest customers. One company says "We were supplying 40-50,000 tons of billets to Lebanon, Jordan and the Far East. Iran took 600,000 tons of steel products in early 1983." He continued: "Our biggest problem is transportation shortages."

Greece has steadily increased its crude steel output from 813,000 tons in 1979 to an estimated 920,000 tons in 1983. More industry expansion is planned there too.

Latin America

Latin American steel is worried. The region is seriously strangled by the burden of external debt, the restrictions required by domestic concerns, plus the generalized slump in public and private demand. It is fearful that its export markets will be shut off, the result of protectionist barriers.

The Instituto Latinoamericano del Fierro y el Acero—ILAFA—surveyed its members and projected that the member nations, and companies, would produce over 28 million tons of crude steel in 1983.

Surprisingly, in view of the above expressed concerns, steel production in the Latin American countries amounted to 20.8 million tons in the first nine months of 1983. This represents a 2.7 pct growth relative to the same period in 1982, which is quite good when compared with the losses registered by the EEC and Japan.

ILAFA points out that a major share of the production increase is attributed to exports outside the region. Exports will exceed 5 million tons, a new record.

Protectionism abroad looms as the major unknown in future marketing plans. Latin America's steel industry has demonstrated it has real comparative advantages and efficiency to produce steel.

With the coming on-stream of Brazil's Tubarao steel complex in December 1983, with a projection production of 1.5 million tons of steel in 1984, and an improving world economy, it is probable that the Latin American steel industry will produce 30 million tons of steel in 1984.

Reprints available while supply lasts. For single copy, circle No 85 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4453.

Crude Steel Production—Millions of Tons

[redacted]	Belgium	Luxembourg	[redacted]	Latin America	
[redacted]	12.3	4.6	[redacted]	29.0	1980
[redacted]	12.2	3.7	[redacted]	27.3	1981
[redacted]	9.8	3.5	[redacted]	27.1	1982
[redacted]	9.8	3.1	[redacted]	28.2	1983*
[redacted]	N/A	N/A	[redacted]	30.0	1984*

*Estimates—first 9-10 months of 1984
Source: ILafa & IISI

said ingot prices could rise anywhere from 5¢ to 10¢ this year, with Comex at 84¢, the London Metal Exchange price at 80¢, and the free market duty-paid price at 85¢ a lb by the end of the first quarter. LME ingot is 99.5 pct, unalloyed ingot while Comex ingot is 99.7 pct metal. The rest of the gap with Comex reflects import duties, ocean and inland freight.

Reynolds Metals Co. recently estimated that domestic producers shipped more than 500,000 tons from inventory last year, during which period consumers still ran on thin stocks despite strong increases in real consumption. The company said domestic industry shipments in 1984 could show a 9.5 pct gain to a record 7.5 million tons, with about 38 pct of the anticipated gain coming from the transportation sector alone. Last year, transportation applications accounted for about 23 pct of the total gain. When car production is up by 1.1 million units-plus and the average car uses 135 lbs of aluminum, the effect is quite apparent.

Exchange inventories holding down copper prices

Copper prices entered 1984 in about the same shape they left 1983—wobbling up and down over a narrow range and still waiting for the U.S. business recovery to visit copper's neighborhood.

Phelps Dodge Corp., Inco Ltd. and Noranda Sales Corp. were experimenting with various pricing formulas based on daily Comex quotations, but the Comex itself—and the London Metal Exchange as well—remained more influenced by heavy warehouse stocks than by U.S. business levels and growing expectations that European demand is due for a pickup soon. Comex and LME warehouse stocks at the start of the year were roughly 65 pct higher than they were a year earlier.

Warren Felson, senior vice president of Metal Traders, Inc., recently predicted that copper prices will move upward this year, "but not to levels that will get copper producers too excited." He noted that copper prices actually slipped 5 pct during the first year of the U.S. business recovery and added that the extent of the 1984 price rise depends on business growth in Europe and the Far East, the trend in capital goods markets and Chinese requirements.

Mr. Felson will be one of a number of copper industry figures examining various changes in copper pricing strategies at the American Copper Council's March 4-9 "Copper College" sessions in Mexico City. George P. Tateosian, chairman of the 1984 session and a vice president of Metal Traders, said the sessions will take a role-playing approach based on the Harvard Business School case-study method.

Phelps Dodge limited its experiment with Comex-based pricing to continuous cast copper rod which, beginning Jan. 2, is being offered at 7¢ a lb over the Comex cathode price for the month of shipment instead of a 4.85¢ a lb premium on the producer price for cathode. The company also retained the option of renewing or adjusting its new method at midyear. Coincident with the change was a decision by the company to withdraw rod tolling services at its continuous cast rod mills in Norwich, Conn. and El Paso, Texas. The company said the move had nothing to do with merchant copper, but some observers said the company had grown concerned over the rise in tolling at its mills and wanted to see its customers run more Phelps Dodge metal through instead.

Shipments of magnesium die castings lag zinc and aluminum

It's easy to see why Amax Magnesium didn't raise its price for die casting grades of magnesium when the primary magnesium price was increased by 5¢ to $1.43 lb by the Amax Inc. unit and by Dow Magnesium.

Magnesium die casting grades have lost ground to zinc and aluminum.

Shipments of magnesium die castings last year were running about 22 pct under the 1982 rate and about half the volume shipped in 1981. Shipments of aluminum and zinc die castings, meanwhile, were up smartly last year.

Joseph Viland, vice president-sales for Amax Magnesium, said the company was holding its prices for AZ91B and AZ91HP die casting grades at $1.25 a lb because it felt a price hike would discourage efforts to win automotive applications. Dow Magnesium raised its price for AZ91B by 5¢ to $1.28 a lb.

George F. Ditshazy, purchasing manager for General Motors Corp.'s casting division at Saginaw, Mich., told a recent meeting of the National Association of Recycling Industries that the major deterrent to wider magnesium use by GM is its cost relative to other lightweight materials and processing difficulties. He said GM currently uses about 600,000 lbs of magnesium a year and this is expected to increase only as a function of increased car production.

Another concern, he said, was "the limited number of sources who can supply magnesium competitively in the U.S.—if magnesium can't be supplied competitively, it will be limited to its optimum application.

Scrap price corrections

Scrap prices in Hamilton, Ont., did not rise in December 1983. However, *Iron Age* is revising broker buying prices to align them more closely with mill buying prices. The following are the corrected prices for Hamilton and are effective Dec. 12, 19, and 27, 1983.

No. 1 heavy melt—$72
No. 2 heavy melt, cut 2 ft—$67
No. 1 dlr. bundles—$77
No. 2 dlr. bundles—$43
Mixed steel scrap—$49
Busheling, new fact. prep.—$75
Busheling, new fact. unprep.—$65
Mach. shop turn.—$35
Short steel turn.—$38
Mixed borings and turnings—$25
Cast scrap—$63

PRICE & PRODUCTION DATA

(Effective January 9, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	191	145	194	123
Buffalo	9	7	9	31
Pittsburgh	222	172	227	127
Youngstown	103	76	89	56
Cleveland	124	116	141	48
Detroit	136	101	136	108
Chicago	430	331	516	373
Cincinnati	92	66	90	62
St. Louis	53	39	73	55
Southern	161	132	159	86
Western	76	66	76	67
U.S. Production	1,597	1,251	1,710	1,136

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton	80.50-86.9*
Old range, non-bessemer	gross-ton	$32.78
Mesabi, regular-unscreened	gross-ton	$32.53
Mesabi, non-bessemer	gross-ton	$30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective January 9, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,597	1,251	1,597	1,102
Capability Utilization Rate	61.4	43.3	61.4	38.0

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 96.50	$ 90.50	$ 86.17	$ 60.17
No. 2 bundles	$ 59.50	$ 58.50	$ 54.50	$ 41.83

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 96.50	$ 96.50	$ 90.50	$ 62.50
No. 1 steel, Philadelphia	89.50	89.50	83.50	56.50
No. 1 steel, Chicago	103.50	85.50	84.50	61.50
No. 1 bundles, Detroit	95.50	95.50	86.50	48.50
Low Phos., Youngstown	94.50	88.50	88.50	64.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	61.50
No. 1 mach'y cast., Phila	100.50	97.50	97.50	98.50
No. 1 mach'y cast., Chi	115.50	115.50	111.50	104.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective January 9, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	66.50-67.50	67.50-69.00	1/9/84
Lead	26.00-27.00	24.00-27.00	12/30/83
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	49.00-51.00	49.00	1/5/84

ALUMINUM: 99.5%. COPPER (C) – cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$365.25
Indium, dollars per troy oz.	$3.20
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$325-$340
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.24
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Jan. 2—Holiday
Jan. 3—566.24
Jan. 4—564.86
Jan. 5—564.46
Jan. 6—564.46

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	63½	61
Yellow brass	57¾	57½
Red brass	59½	59¼
Comm. bronze	60	59¾
Mang. bronze	59½	58¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	60
No. 2 copper wire	50
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	46
Light copper	38
No. 1 composition	51
No. 1 comp. turnings	49
Hvy. yellow brass solids	31
Hvy. yellow brass turnings	27
Radiators	41

Aluminum

New mixed clips	48	—49
Old sheet	48	—49
Old cast	48	—49
Clean dry borings	48	—49

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	40	—41
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	28	—29

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	38	—39
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	— 16
Old diecast zinc	10	— 11

EFFECTIVE JAN. 9, 1984

(Effective January 9, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 96.00 to $ 97.00
No. 2 hvy. melting	86.00 to 87.00
No. 1 dealer bundles	119.00 to 120.00
No. 1 factory bundles (auto)	122.00 to 123.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	119.00 to 120.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	49.00 to 50.00
Low phos. punchings plate	119.00 to 120.00
Heavy turnings	86.00 to 87.00
No. 1 RR hvy. melting	116.00 to 117.00
Rails 2 ft. and under	121.00 to 122.00
Scrap rails, random lgth.	107.00 to 108.00
RR specialties	115.00 to 116.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	580.00 to 590.00
18-8 turnings	480.00 to 490.00

Chicago

No. 1 hvy. melting	$103.00 to $104.00
No. 2 hvy. melting	95.00 to 96.00
No. 1 dealer bundles	114.00 to 115.00
No. 1 factory bundles (auto)	114.00 to 115.00
No. 2 dealer bundles	59.00 to 60.00
No. 1 busheling	113.00 to 114.00
Shredder scrap	105.00 to 106.00
Machine shop turn.	49.00 to 50.00
Mixed bor. and turn.	50.00 to 51.00
Shoveling turnings	60.00 to 61.00
Cast iron borings	64.00 to 65.00
Low phos. forge crop	122.00 to 123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to 133.00
Low phos. 2 ft. and under	127.00 to 128.00
No. 1 RR hvy. melting	109.00 to 110.00
Scrap rails, random lgth.	93.00 to 94.00
Reroller rails	108.00 to 109.00
Rails, 2 ft. and under	120.00 to 121.00
RR couplers and knuckles	108.00 to 109.00
RR car axles	124.00 to 125.00
No. 1 machinery cast	115.00 to 116.00
Cupola cast	106.00 to 107.00
Stove plate	106.00 to 107.00
Steel car wheels	117.00 to 118.00
Stainless	
18-8 bundles and solids	560.00 to 570.00
18-8 turnings	460.00 to 470.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 88.00 to $ 91.00
No. 2 hvy. melting	75.00 to 78.00
No. 1 dealer bundles	102.00 to 105.00
No. 2 dealer bundles	58.00 to 61.00
No. 1 busheling	102.00 to 105.00
Shredder scrap	100.00 to 103.00
Machine shop turn.	29.00 to 32.00
Mixed bor. and turn.	29.00 to 32.00
Shoveling turnings	47.00 to 50.00
Low phos. 5 ft. and under	102.00 to 105.00
Low phos. 2 ft. punchings	117.00 to 120.00
Electric furnace bundles	117.00 to 120.00
RR specialties	102.00 to 105.00
Rails, 2 ft. and under	117.00 to 120.00
Cupola cast	70.00 to 73.00
Heavy breakable cast	56.00 to 57.00
No. 1 machinery cast	99.00 to 102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to $ 72.00
No. 2 hvy. melting	68.00 to 69.00
No. 1 dealer bundles	95.00 to 96.00
No. 2 bundles	47.00 to 48.00
No. 1 busheling	94.00 to 95.00
Drop forge flashings	68.00 to 69.00
Machine shop turn.	35.00 to 36.00
Mixed borings and turn.	22.00 to 23.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	44.00 to 45.00
Heavy breakable cast	35.00 to 36.00
Mixed cupola cast	51.00 to 52.00
Automobile cast	74.00 to 75.00
Stainless	
18-8 bundles and solids	480.00 to 490.00
18-8 turnings	370.00 to 380.00
430 bundles and solids	130.00 to 140.00

Youngstown

No. 1 hvy. melting	$ 86.00 to $ 89.00
No. 2 hvy. melting	69.00 to 72.00
No. 1 dealer bundles	98.00 to 101.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	93.00 to 96.00
Electric furnace bundles	88.00 to 91.00
Galvanized bundles	82.00 to 85.00

Cleveland

No. 1 hvy. melting	$ 82.00 to $ 85.00
No. 2 hvy. melting	50.00 to 53.00
No. 1 dealer bundles	100.00 to 103.00
No. 1 factory bundles	103.00 to 106.00
No. 2 bundles	25.00 to 28.00
No. 1 busheling	99.00 to 102.00
Machine shop turn.	13.00 to 16.00
Mixed bor. and turn.	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	115.00 to 118.00
Low phos. punchings plate	115.00 to 118.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	117.00 to 120.00
Rails, 18 in. and under	118.00 to 121.00
Steel axle turnings	67.00 to 70.00
Railroad cast	94.00 to 97.00
No. 1 machinery cast	97.00 to 100.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 77.00 to $ 78.00
No. 2 hvy. melting	53.00 to 55.00
No. 1 busheling	87.00 to 88.00
No. 1 dealer bundles	88.00 to 89.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. plate	91.00 to 92.00
Structural and plate, 2 ft. and under	95.00 to 96.00
Rails, 2 ft. and under	97.00 to 98.00
Scrap rails, random lgth.	77.00 to 78.00
No. 1 machinery cast	71.00 to 72.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 82.00 to $ 83.00
No. 2 hvy. melting	71.00 to 72.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	68.00 to 69.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	40.00 to 41.00
No. 1 RR hvy. melting	92.00 to 93.00
Rails, random length	86.00 to 87.00
Rails, 18 in. and under	102.00 to 103.00
RR specialties	95.00 to 96.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	85.00 to 86.00
Cast iron car wheels	57.00 to 58.00
Rerolling rails	102.00 to 103.00
Unstripped motor blocks	64.00 to 65.00

Birmingham

No. 1 heavy melting	$ 73.00 to $ 74.00
No. 2 heavy melting	69.00 to 70.00
No. 1 dealer bundles	76.00 to 77.00
No. 2 bundles	55.00 to 56.00
No. 1 busheling	75.00 to 76.00
Shredder scrap	99.00 to 100.00
Machine shop. turn.	29.00 to 30.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	39.00 to 40.00
Electric furnace bundles	69.00 to 70.00
Elec. furnace, 3 ft. & under	76.00 to 77.00
Structural and plate, 2 ft.	105.00 to 106.00
Structural and plate, 4 ft.	99.00 to 100.00
No. 1 RR hvy. melting	94.00 to 95.00
Scrap rails, random lgth.	88.00 to 89.00
Rails, 18 in. and under	106.00 to 107.00
Angles and splice bars	97.00 to 98.00
No. 1 cupola cast	93.00 to 94.00
Unstripped motor blocks	69.00 to 70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to $ 74.00
No. 2 hvy. melting	67.00 to 68.00
No. 1 dealer bundles	86.00 to 87.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	26.00 to 27.00
Low phos. 18 in. and under	108.00 to 109.00
Rails, random length	84.00 to 85.00
Rails, 2 ft. and under	100.00 to 101.00
No. 1 cupola cast	77.00 to 78.00
Heavy breakable cast	38.00 to 39.00
Drop broken cast	90.00 to 91.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 46.00 to $ 47.00
No. 2 hvy. melting	40.00 to 41.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	500.00 to 520.00
18-8 turnings	400.00 to 420.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 62.00 to $ 64.00
No. 2 hvy. melting	52.00 to 54.00
No. 1 dealer bundles	76.00 to 78.00
No. 2 bundles	40.00 to 42.00
No. 1 busheling	80.00 to 82.00
Shredder scrap	78.00 to 80.00
Machine shop turn.	12.00 to 14.00
Shoveling turnings	18.00 to 20.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	47.00 to 49.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 48.00 to $ 50.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	76.00 to 78.00

Los Angeles

No. 1 hvy. melting	$ 50.00 to $ 52.00
No. 2 hvy. melting	40.00 to 42.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 dealer bundles	19.00 to 21.00
Machine shop turn.	6.00 to 8.00
Shoveling turnings	10.00 to 12.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	75.00 to 77.00
No. 1 cupola cast	75.00 to 77.00

Seattle

No. 1 hvy. melting	$ 73.00 to $ 75.00
No. 2 hvy. melting	62.00 to 64.00
No. 2 bundles	42.00 to 44.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 82.00
No. 2 heavy melting cut 2 ft. and under	77.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	40.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	68.00

Houston

Brokers buying prices per gross ton on cars:

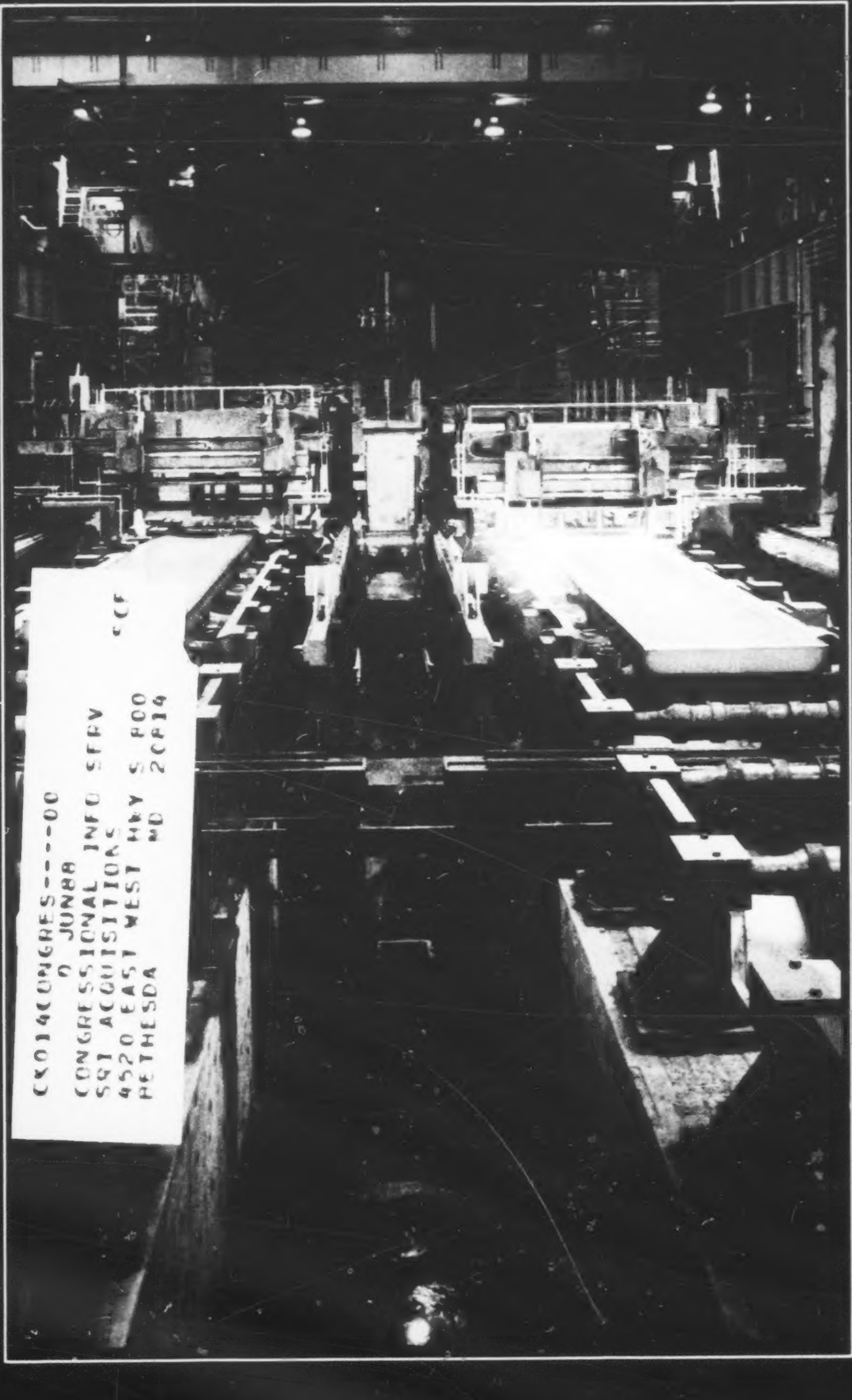
No. 1 hvy. melting	$ 87.00 to $ 88.00
No. 2 hvy. melting	71.00 to 72.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	23.00 to 24.00
Crushed turnings	47.00 to 48.00
Shredder scrap	87.00 to 88.00
Cut structural plate 2 ft. and under	94.00 to 96.00
Unstripped motor blocks	62.00 to 63.00
Cupola cast	86.00 to 87.00

C2110-2

CHILTON'S

IRONAGE METALS PRODUCER

February 6, 1984



CR014CONGRES---00 0 JUN88 CCF
CONGRESSIONAL INFO SERV
SQT ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

ROD & WIRE REPORT: COOL PRICES IN A HOT MARKET

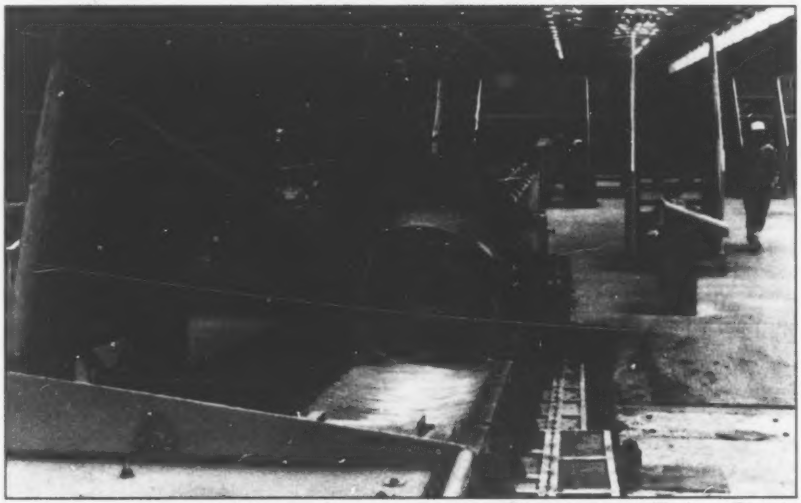
THE HOT SPOT: HOW TWO EXECUTIVES SEE THE TRADE ISSUE

IN PLANT SPOTLIGHT: REPUBLIC'S NEW CLEVELAND CASTER

QUALITY: WHAT IT TAKES

FEBRUARY 6, 1984 VOL. 227, NO. 3

CHILTON'S
IRON AGE
METALS PRODUCER



Cover photo: Republic's new Cleveland caster. Photo above: Raritan River's retarded cooling Stelmor line.

Editorial 7
You ain't seen nothin' yet!

Newswatch 13
Specialty steel actions spark EEC salvo and U.S. retort.

Wire and Rod Mills 23
Cool prices in a hot market.

Hot Spot 29
Two executives debate the trade issues.

In-Plant Spotlight 31
Republic unveils its efficient new caster.

Quality, What It Takes 35
What's involved in the world's largest SS pickling plant.

Auto-Tech 40
Detroit is using new inspection systems

Financial Analysis 58
'Automatic' pay hikes may be nearing an end.

Materials Report 61
Steelmakers are starting to put sheet products on allocation.

Price Trends 76
Producer prices posted a moderate 0.2 pct rise in December.

Next Issue: World Steel Mill Financing Report

Departments

EDITORIAL STAFF **8**
SIGNED, SEALED AND DELIVERED **11**
INDUSTRIAL BRIEFS **18**
PRODUCT & EQUIPMENT REVIEW **49**
P&P DATA 1/23/84 **63**
FERROUS SCRAP 1/23/84 **65**
AD INDEX **66**
MANAGEMENT SERVICE CARD **67**
BUSINESS STAFF **68**
STEEL PRICES **71**
STEEL PRICES **73**
CLEARING HOUSE **71**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

ONE OF THE ABC PUBLISHING COMPANIES

Chilton

more damage than the specialty steel restrictions, the U.S. would have no recourse but to fight back harder.

For the most part the Reagan Administration is opposed to world-wide quotas on steel but, obviously, gave in to the logic of specialty steel industry's case against the Europeans. Beyond the trade retaliation steel quotas would engender, said Commerce Secretary Malcolm Baldridge, it could well lead to calls for quotas from a multitude of other industries like autos and machine tools.

Richard P. Simmons, president of Allegheny Ludlum Steel Corp., and a leading force in the specialty steel industry, said the industry "is continuing investigations and other unfair trade practices by other countries and may file additional cases in the near future."

Spanish stainless steel makers face dumping suit

The future that Mr. Simmons foresaw arrived in the form of a dumping complaint filed by American stainless steel producers, charging that stainless sheet and strip from Spain is being dumped in the U.S.

Dumping margins of 9 to 37 pct were charged in the complaint filed jointly by nine specialty companies and United Steelworkers of America.

Named in the petition was ACERINOX, a Spanish company that recently completed an expansion program.

The action was the first since the Reagan Administration established a program to hold down specialty imports. The Administration set quotas, for stainless bar and rod, and tool steel imports and raised tariffs on stainless flat rolled products.

Domestic stainless sheet and strip producers had sought quotas and warned that the tariff boost would be ineffective.

The American producers now apparently feel the accuracy of their warnings has been shown. "It is apparent the Spanish producer is continuing to dump stainless sheet and strip in the United States despite the additional 10 pct tariff placed on these products by the President," said Mr. Simmons.

The domestic companies said stainless sheet and strip imports from Spain in the first 11 months of 1983 were up 64 pct over the 12 months of 1982. The Spanish shipments accounted for 18.2 pct of total stainless sheet and strip in the United States despite the additional 10 pct tariff.

Shipments of Spanish Stainless Steel

(sheet and strip products)

	Quantity in net tons	Pct of total imports
1980	96	0.3
1981	5,003	7.1
1982*	7,279	9.2
1983*	13,726	18.2

*includes first 11 months of year.

Source: Specialty Steel Industry of the United States

Bethlehem and USWA ask for steel import quotas

Asserting "there is absolutely no free trade in steel," Bethlehem Steel Corp., the nation's second largest steelmaker, and the United Steelworkers of America (USWA) are exhorting the Reagan Administration to clamp down on steel imports.

Bethlehem and the union are invoking Section 201 of the 1974 Trade Act. It allows U.S. industries to obtain government protection if they have been severely hurt by an increase in imports regardless of whether fairly or unfairly traded.

In petitions filed with the U.S. International Trade Commission (ITC), the steelmaker and the labor union have asked the Administration to curb steel imports—even those which are fairly traded—within eight months. They asked the ITC to speed its investigation of the complaint and recommend quotas to President Ronald Reagan within six months. Mr. Reagan then has two months to approve, change or dismiss the petition.

No major steelmaker has ever sought protection under this section of the Trade Act, the American Iron and Steel Institute observed. Institute President Robert Peabody told *Iron Age*, "the filing of the 201 petition will be helpful in as much as it serves to point out to the world community, decisionmakers in Washington and the American people the seriousness of the domestic industry's problem. It's too early for the AISI to evaluate what could be the advantage or disadvantages to the industry or to Bethlehem of such a move."

The Reagan Administration has been treading a fine diplomatic line between trying to appease the domestic industry and ease the anxieties of the European Economic Community. The Administration, in 1982, negotiated an export agreement with the Europeans which the EEC is now threatening to abrogate if Bethlehem and the USWA prevail in their petitions.

Other domestic steel producers are staying well clear of the injury petition filed by Bethlehem Steel and USWA.

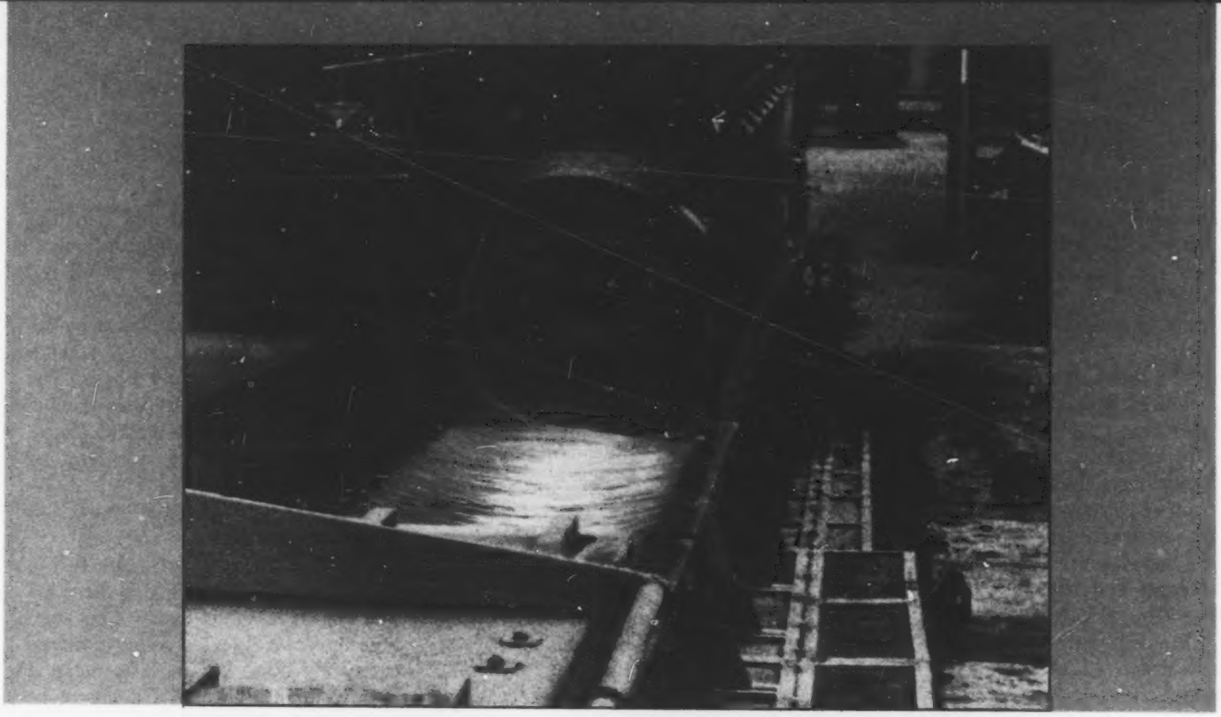
"We place great value on the voluntary restraint policies undertaken by our European allies and Japan," said Harry Holiday, chairman of Armco, Inc. "We hope they will recognize that this action need not affect them."

The 201 petition reflects a "high degree of frustration" domestic mills feel about imports, noted Julian Scheer, senior vice president, LTV Corp. "However, a 201 filing is not productive."

Among those not joining in the action are National Intergroup, Armco and Inland Steel Co. There has been no statement from United States Steel Corp., but earlier comments by David M. Roderick, its chairman, indicated opposition to the 201 complaint.

U.S. copper producers seeking import restrictions

At the start of a not-too-promising January for domestic copper producers, Phelps Dodge Corp. has called for revival of a drive for import protection as a shield against excess foreign production backed by Inter-



COOL PRICES IN A HOT MARKET

With a number of rod and wire mills closing, domestic capacity could eventually tighten the supply of all steel products. This situation could bring added pressure for additional imports into the United States market by foreign producers.

On Dec. 27, United States Steel Corp. announced it was closing nearly all its wire rod facilities.

Shortly before this, representatives of the independent West Coast wire companies argued in Washington, D.C. against curbs on rod imports. The companies said cuts in domestic capacity had left them stranded and unable to survive without imported rod.

This sequence is significant on a number of counts. For one thing, it may provide a forerunner of things to come in the whole steel market. Since the start of 1983, 15 million tons of domestic steel capacity have been liquidated or slated for liquidation.

The very rapid contraction of domestic capacity could eventually tighten the supply of all steel products. With a closer market balance, U.S. mills hope to be able to make some money. As the wire rod situation indicates, however, the actual effect could be to bring pressure for more imports.

The second interesting aspect of recent events is that they point up the dynamic state of the rod and wire business. This is certainly true in the technical sense; in the space of 10 years, the speeds of rod mills have doubled.

It is also true from a market standpoint. Rod and wire have enjoyed a vigorous growth pattern. With the overall steel industry operating under 60 pct in late 1983, the mini-mills that specialize in rods were producing at 100 pct.

"We've been operating 20 turns a week," said C.F. Nelson, Jr., vice president, sales and marketing, Atlantic Steel Co.

"We've had excellent months," said T.N. Tyrrell, vice president, marketing, Raritan River Steel Co.

The favorable conditions for wire and rod mean demand must be pretty good for the wire companies that use the rod. "Business has been good for us," said Jack Long, head of President's Island Steel Co. in Memphis, Tenn. "We're real worried about the domestic supply of rods with some of the mills closing down," Mr. Long added.

BY GEORGE J. MCMANUS

The wire business has been relatively good right along. In 1982, when steel shipments fell 30 pct, shipments of wire and wire products were off only 10 pct. As Mr. Long indicated, demand is now strong enough for the wire people to be concerned about rod supply.

In explaining the new market trend, Mr. Long cited such things as the swing back from plastics to wire for refrigerator racks. Others noted that wire has a broad market base.

"Wire is very diversified," said Calvin Taft, head of Gilbert and Bennett, Georgetown, Conn., and also president of the American Wire Producers Association. "Whereas basic steel producers are tied to heavy construction," said Mr. Taft, "wire goes into a multitude of consumer and industrial products."

Severe spring weather hurt the home gardening products of Gilbert and Bennett in 1983. Demand is now "picking up a little."

If things are so great in the wire and rod, why are some people getting out of the business? The various reasons can be boiled down to one simple fact.

Price Trends

"The prices are God-awful," said J.B. McKinney, president of Laclede Steel Co. About 25 pct of Laclede's steel goes into rod and wire.

The rod mills are going through a painful transition during which their own prices are still depressed while scrap prices are shooting up. The combination of rising costs and strong demand is starting to have some effect.

Raritan River has had partial success in putting through increases, but not enough to keep up with scrap costs. "The problem," said Mr. Tyrrell, "is that rod prices are quoted 45 days ahead so there is a lag in catching up with costs."

As to why there should be price problems when people are afraid of shortages, part of the answer lies in the changing composition of the rod and wire fields.

The large, integrated mills have been withdrawing from both fields. The mini-mills have achieved a dominant position in rods with over 50 pct of the market. Independent companies have captured 65 pct of the wire business.

The other big factor is imported steel. Through October 1983, imported rod accounted for 29 pct of domestic supply. Imports are now reaching inland as well as coastal areas.

Imported wire products are also arriving in large quantities. "They already have 50 pct of the West Coast market," said Peter Suchman, a lawyer who is representing West Coast independents in Washington proceedings. "They have 23 to 25 pct of the U.S. market."

Mr. Suchman argued that low priced rod imports were needed in order for domestic companies to compete against imported wire. "If foreign rod suppliers were shut out or forced to raise their prices," he said, "the product business would go to offshore sources."

These comments were occasioned by the fair trade suits filed by five domestic rod companies: Atlantic Steel, Raritan River, Continental Steel Co., North Star Steel Texas and Georgetown Steel Corp.

Complaints against Brazil and Trinidad have been upheld and penalties were due to be levied in late December. The suits have effectively cut off rod imports from those countries.

Now pending are complaints by domestic rod producers against Argentina, Mexico, Poland and Spain. The West Coast independent wire companies, headed by Davis-Walker Corp., have intervened in these cases, arguing before the International Trade Commission that they need the foreign rod.

Import Question

With regard to imports, Mr. Taft of Gilbert and Bennett indicated there are two separate questions. "The suits aren't necessarily going to mean no rod comes in. What it's going to mean is the rod that comes in is going to be more expensive."

"This doesn't conflict with the position of the American Wire Producers Assn.," Mr. Taft said. "Our position has historically been, and still is, that we are for free and fair trade in wire rods. We want free access to world wire rod sources, but we also want those sources to trade their rod fairly and not dump or have a countervailing duty situation."

Mr. Taft added that West Coast companies had particular problems. "They have a special case out there in that they don't have U.S. rod mills."

"The question of dumping doesn't

U.S. CARBON WIRE & WIRE PRODUCTS MARKET—1967-1982

(BASED ON SHIPMENTS—IN ROD EQUIVALENT TONS)

(000 Net Tons)

Year	Domestic Rod Shipments	Pct of Total	W&WP* Shipments	Pct of Total	Total U.S. Shipments	Pct of Total	Import Rod Shipments	Pct of Total	Import W&WP Shipments	Pct of Total	Total Imports	Pct of Total	Total Shipments
1967	1266	18.9	3263	48.7	4529	67.6	1076	16.1	1098	16.4	2174	32.4	6703
1968	1339	17.1	3534	45.1	4873	62.2	1600	20.4	1358	17.3	2958	37.8	7831
1969	1623	21.2	3391	44.2	5014	65.4	1261	16.5	1394	18.2	2655	34.6	7669
1970	1681	23.5	3122	43.6	4803	67.1	1056	14.8	1296	18.1	2352	32.9	7155
1971	1587	21.4	2907	39.1	4494	60.5	1544	20.8	1391	18.7	2935	39.5	7429
1972	1919	24.1	3075	38.7	4994	62.8	1403	17.6	1556	19.6	2959	37.2	7953
1973	2040	24.4	3380	40.5	5420	64.9	1416	17.0	1512	18.1	1928	35.1	8348
1974	1861	21.0	3304	37.2	5165	58.2	1951	22.0	1759	19.8	3710	41.8	8875
1975	1298	22.5	2243	38.9	3541	61.3	1113	19.3	1118	19.4	2231	38.7	5772
1976	1901	27.5	2563	37.1	4464	64.5	1121	16.2	1332	19.3	2453	35.5	6917
1977	1804	24.3	2501	33.7	4305	58.1	1342	18.1	1768	23.8	3110	41.9	7415
1978	2554	30.0	1615	30.7	5169	60.8	1327	15.6	2012	23.6	3339	39.2	8508
1979	2861	35.2	2547	31.3	5408	66.5	985	12.1	1734	21.3	2719	33.5	8127
1980	2475	35.3	1857	28.0	4332	65.2	830	12.5	1479	22.2	2309	34.8	6641
1981	2546	40.0	1728	24.3	4575	64.2	888	12.5	1659	23.3	2547	35.8	7122
1982	2369	38.6	1374	22.4	3743	61.0	961	15.7	1428	23.3	2389	39.0	6132

*By wire producers with captive rod mills.

Source: AISI & Dept. of Commerce. Excerpted from testimony of West Coast Ad Hoc [illegible] Steel Wire Producer Committee before the International Trade Commission.

arise," said Mr. Suchman, "if there is no injury to domestic mills."

As to the domestic supply sitution, there probably isn't yet a shortage. "There is ample capacity in this country to meet domestic requirements," said Roger R. Regelbrugge, chairman of Georgetown Steel Corp.

Nevertheless, it is true that a number of the rod mills are producing at very high rates. Both Raritan River and North Star Texas are hitting new production highs almost every month.

Georgetown Steel hasn't gone to the kind of maintenance or overtime schedule that might be employed in a boom market, but the company has little slack otherwise.

"When we're running, we're running flat out," said Mr. Reggelbrugge. "We're probably not running at full capacity, but we're not far from it."

It's also true there could be problems getting the right kind of rod. For appliance applications, President's Island Steel needs low carbon rod. "When supply tightens," said Mr. Long, "the mills tend to shift to high carbon rod, the premium products.

"There are spring applications where the customers want rimmed steel" he said. All the continuous cast steel of mini-mills is killed. With the tonnge mills withdrawing, rimmed material could soon be extinct in rod form.

Vulnerability

There is no question the wire companies feel vulnerable, particularly those in outlying areas. "Our main supplier is Raritan," said Mr. Long. "You always worry about being in Memphis, Tenn., with your main supplier in New Jersey.

In this setting, U.S. Steel is shutting down its rod mills. On paper, this is subtracting 2 million tons of capacity. As a practical matter, some of the capacity being officially retired has been sidelined for some time. U.S. Steel's rod mill at South Works hasn't operated since June 1981.

A second point is that the shutdown is part of the continuing shift of capacity from maxi-mills to mini-mills. This is literally true of one facility. U.S. Steel's rod mill at Pittsburg, California, is being revamped and installed at Kokomo, Ind., plant of Continental Steel. The mill is scheduled to begin operating this Spring.

(Cont. on p. 28)

Raritan Takes Another Giant Step

"We're going to bring our capacity up by 25 pct," said William J. Shields, president, Raritan River Steel Co.

At a time when many steel companies are shutting down facilities, Raritan River is expanding. Even more remarkable, the Perth Amboy, N.J., company is modernizing a steel plant that is one of the newest and most efficient in the world.

Raritan River began operating in 1980 with a high-powered electric furnace, a continuous caster and a high speed rod mill. Now, just four years later, all phases of the operation are being upgraded and updated.

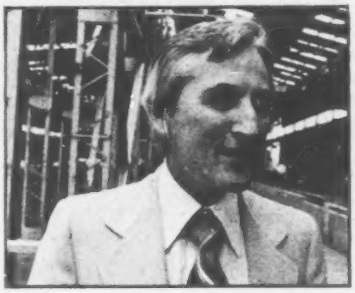
One big step will be the conversion of the 150-ton electric furnace to the eccentric bottom tapping technology of Mannesmann Demag Corp. Scheduled for completion in July 1984, the conversion will boost melting capacity to 650,000 tons.

The billet size off the caster will be increased. Finishing speed of the rod mill will be boosted to 20,000 fpm. Initially rated for 600,000 tons a year, the rod mill will be able to roll 750,000 tons annually. Maximum coil size will be increased from 4,400 lbs to 4,700 lbs.

It's worth repeating that these changes are being made in an operation that is already highly efficient. Raritan River is making 150-ton heats in 103 minutes tap-to-tap. That comes to 73 tons an hour. Labor content of melting and rolling operatin is only about 1 1/2 manhours a ton.

The new facilities and practices will give still greater productivity and will also promote high quality. With regard to quality, Mr. Shields emphasizes the link between electric furnace design and ladle metallurgy.

"Before you go into exotic metallurgy, you have to go to slag-free tapping," he said.



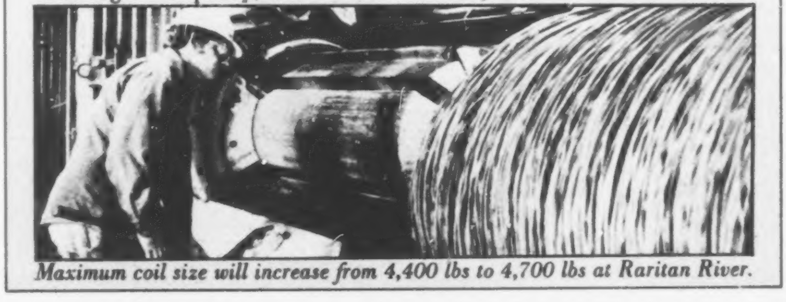
Facilities at Raritan River will expand by 25 pct said William T. Shields, president.

With the original bottom tapping design, it was impossible to prevent slag carry-over. The tap hole was in the center of the bottom and the furnace had to be emptied once metal started to flow.

As a way around this difficulty, the eccentric design was developed by Mannesmann Demag, August Thyssen and Det Danske Staalvalsevaerk. Here, the tap hole is located near the bottom of the furnace but off to one side. The hole is closed by a flap which is not in contact with the hot metal.

This arrangement makes it possible to operate with a hot heel in the furnace. Raritan River plans to leave about 10 tons of liquid steel in the furnace after each heat.

Advantages reported by Mannesmann Demag for eccentric bottom tapping include slag free tapping, reduced tapping time, reduced melting time and reduced refractory consumption.



Maximum coil size will increase from 4,400 lbs to 4,700 lbs at Raritan River.

Another portion of the subtracted capacity will be offset by brand new rod mills. A rod finishing train from Morgan Construction Co. is being added to a bar mill at Northwestern Steel & Wire Co. Startup will be in early 1984.

Finally, two new rod mills are under consideration for mini-mills.

None of this fully explains why some people are getting out of the rod business while other people are getting in. In announcing its withdrawal, U.S. Steel cited competition with the mini-mills and imports.

"The hourly employment costs at nonintegrated mills are as much as $9 below those of integrated producers," said David M. Roderick, U.S. Steel chairman.

The newest mini-mills make highly efficient use of their labor. According to one estimate, Raritan River needs only one and a half manhours to make a ton of finished rod.

When U.S. Steel was examining its facilities prior to the shutdown, a top executive came to a bar mill. "The mill was good as any in the world," he reportedly said, "but the steel had four manhours in it by the time it reached the mill.

The mini-mills operate on scrap, which was selling at low prices until recently. They are 100 pct continuous casting. And the newest mills have super-speed rod mills.

On this last point, it's important to note that U.S. Steel rod mills aren't all that old. A broad modernization in the mid-1970s saw new Morgan rod mills installed at South Works, and Pittsburg, Calif. Along with the Fairless mill built in the late 1970s, these mills were designed to finish at 10,000 fpm.

Next Generation

At the time, that seemed to represent something close to the ultimate. In the early 1950s, 5,000 fpm had been considered a high speed for a rod mill. Even today, no strip mill runs at more than 4,000 fpm.

In 1974, it became clear the next generation of rod mills would be still faster. A Morgan mill designed to finish at 15,000 fpm was ordered by Georgetown Texas Steel Corp. (Now North Star Steel Texas).

In 1977, a second Morgan mill designed for 15,000 fpm was ordered by Raritan River. This was equipped with pre-finishing stands.

In 1979, a Morgan mill designed for 15,000 fpm was ordered by Atlantic Steel. Prior to the startup of this mill, Atlantic had produced rod primarily for its own use; the company is one of the few integrated producers of merchant wire products. The new mill provided the capacity for outside rod sales.

In 1980, mills rated for 18,000 fpm were ordered by two Japanese companies.

Now in the final stages of construction is the Morgan finishing train at Northwestern Steel & Wire. Designed to roll at 20,000 fpm, this is being added to an existing 12-in. bar mill. Yearly capacity of rod and bar will be 450,000 tons.

The Northwestern rod mill will have interstand cooling and water cooling boxes integrated into a six-zone retarded cooling Stelmor line. Related facilities include a Morgan TF-1000 series compactor and four buttweld Fryer Tyers. Rod sizes will range from 0.218 to 0.625 in. Maximum coil weight will be 3,000 lbs, but the system is being built to handle 4,000 lbs coils.

Also designed for 20,000 fpm is a mill being built for the Mizushia Works of Kawasaki Steel Corp. This is being engineered by Morgan. It will be manufactured by Sumitomo Heavy Industries, Ltd., a licensee of Morgan.

These latest installations represent the state of the art. "The new mills are being stabilized on the order of 100 meters per second finishing speed for 5.5 mm and tonnages on the order of 100 metric tons per hour," said Paul S. Morgan, president of Morgan Construction. "That's on a per strand basis."

Mr. Morgan, whose company has been in the forefront of the rod mill revolution, compares these numbers with outputs of 30 tons an hour in 1965.

He feels there will now be a period in which designs are stable and operators learn to get the most out of the newest mills. He doesn't believe rod mill design has reached the ultimate.

The big breakthrough for rod mills came many years ago when Morgan developed the No-Twist TM design. By placing alternate stands at right angles, it was possible to eliminate rotation of rods. Loose jointed spindles and couplings were replaced with tight gearing systems. Single groove rolls provided rigidity.

Over the years, a combination of operator experience and improved design lifted rolling speeds. By the early 1970s, the limits of existing designs had been reached. It was at this point that the order from Georgetown-Texas brought on a new generation of mills.

World Record

After the Texas mill and its predecessors were installed, operators began the process of searching for maximum output. By July 1983, the twin strand mill of what is now North Star Steel Texas had rolled 64,369 tons for an average of 90.5 tons an hour. That was probably a world record.

"Those records all fell before the end of the year," said Robert Bullard, mill superintendent at the Texas plant. "In September, we set another record by rolling 65,025 tons for an average of 95.6 tons an hour. Then, in December we had our best turn ever of 1,059 tons of one-quarter in. rods."

Raritan River keeps bettering previous production highs, and the company now feels its capacity is 100,000 tons greater than was estimated earlier.

Going with the high speed mills has been progress in cooling and handling rod at the exit end. The big breakthrough in this area was the Stelmor process, developed by Stelco Inc. and Morgan. This takes rod and lays it out on a conveyor in loose loops.

With this arrangement it has been possible to develop highly refined cooling systems. The Northwestern Steel & Wire mill will have a six-zone retarded cooling Stelmor system along with cooling boxes ahead of the mill, between stands and after the mill. Water flow is regulated to give a specific temperature reduction before the rod hits the laying head.

At Raritan River, a prototype of what Morgan calls its Optiflex system has been installed. This provides three control stages for the air cooling system of the Stelmor line. Raritan calls the initial results "very encouraging."☐

Reprints available while supply lasts. For single copy, circle No. 89 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4457

PRICE & PRODUCTION DATA

(Effective January 23, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	206	205	188	158
Buffalo	10	9	8	30
Pittsburgh	253	234	204	158
Youngstown	111	114	95	82
Cleveland	130	133	135	89
Detroit	145	142	125	116
Chicago	517	496	453	381
Cincinnati	93	99	91	65
St. Louis	84	72	58	54
Southern	184	179	162	110
Western	69	79	81	70
U.S. Production	1,802	1,762	1,600	1,313

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective January 23, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,802	1,762	5,161	3,642
Capability Utilization Rate	69.7	67.7	66.6	41.9

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.954
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 93.17	$ 92.50	$ 89.50	$ 61.50
No. 2 bundles	$ 60.83	$ 60.17	$ 58.17	$ 42.50

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 97.50	$ 97.50	$ 96.50	$ 62.50
No. 1 steel, Philadelphia	91.50	89.50	86.50	59.50
No. 1 steel, Chicago	90.50	90.50	85.50	62.50
No. 1 bundles, Detroit	95.50	95.50	86.50	48.50
Low Phos., Youngstown	97.50	97.50	88.50	64.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	61.50
No. 1 mach'y cast., Phila	100.50	100.50	97.50	98.50
No. 1 mach'y cast., Chi	111.50	111.50	113.50	106.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective January 23, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	65.00	64.00-65.00	1/20/84
Lead	24.00-28.00	25.00-28.00	1/16/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	51.00	49.00-51.00	1/10/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$371.35
Indium, dollars per troy oz.	$2.43-$2.65
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$310-$330
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.17
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Jan. 16—564.99
Jan. 17—564.73
Jan. 18—564.86
Jan. 19—565.12
Jan. 20—565.12

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	61⅛	60
Yellow brass	57	57
Red brass	58⅜	58
Comm. bronze	59¼	58¼
Mang. bronze	59¾	57¾
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	50
Light copper	41

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	54
No. 2 copper wire	46
Light copper	37
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	28
Radiators	42

Aluminum

New mixed clips	52	—53
Old sheet	50	—51
Old cast	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	37	—38
Old sheets and cast	34	—35
Borings and turnings	26	—27
Duraluminum clippings	28	—29

Copper and Brass

No. 1 copper wire	48	—49
No. 2 copper wire	40	—41
Light copper	36	—37
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	40	—41
Cocks and faucets	28	—29
Clean heavy yellow brass	25	—29
Brass Pipe	28	—29
New soft brass clippings	41	—42

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	— 16
Old diecast zinc	10	— 11

EFFECTIVE JAN. 23, 1984

(Effective January 23, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 97.00 to	$ 98.00
No. 2 hvy. melting	86.00 to	87.00
No. 1 dealer bundles	119.00 to	120.00
No. 1 factory bundles (auto)	122.00 to	123.00
No. 2 bundles	59.00 to	60.00
No. 1 busheling	119.00 to	120.00
Machine shop turn.	16.00 to	17.00
Shoveling turnings	50.00 to	51.00
Cast iron borings	49.00 to	50.00
Low phos. punchings plate	119.00 to	120.00
Heavy turnings	86.00 to	87.00
No. 1 RR hvy. melting	116.00 to	117.00
Rails 2 ft. and under	121.00 to	122.00
Scrap rails, random lgth	107.00 to	108.00
RR specialties	115.00 to	116.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	590.00 to	600.00
18-8 turnings	490.00 to	500.00

Chicago

No. 1 hvy. melting	$ 90.00 to	$ 91.00
No. 2 hvy. melting	84.00 to	85.00
No. 1 dealer bundles	114.00 to	115.00
No. 1 factory bundles (auto)	114.00 to	115.00
No. 2 dealer bundles	61.00 to	62.00
No. 1 busheling	114.00 to	115.00
Shredder scrap	103.00 to	104.00
Machine shop turn.	49.00 to	50.00
Mixed bor. and turn.	50.00 to	51.00
Shoveling turnings	60.00 to	61.00
Cast iron borings	61.00 to	62.00
Low phos. forge crop	120.00 to	121.00
Low phos. punchings plate ¼ in. and heavier	130.00 to	131.00
Low phos. 2 ft. and under	125.00 to	126.00
No. 1 RR hvy. melting	109.00 to	110.00
Scrap rails, random lgth.	102.00 to	103.00
Reroller rails	112.00 to	113.00
Rails, 2 ft. and under	125.00 to	126.00
RR couplers and knuckles	108.00 to	109.00
RR car axles	129.00 to	130.00
No. 1 machinery cast	111.00 to	112.00
Cupola cast	105.00 to	106.00
Stove plate	106.00 to	107.00
Steel car wheels	114.00 to	115.00
Stainless		
18-8 bundles and solids	540.00 to	550.00
18-8 turnings	440.00 to	450.00
430 bundles and solids	130.00 to	135.00
430 turnings	95.00 to	100.00

Philadelphia

No. 1 hvy. melting	$ 90.00 to	$ 93.00
No. 2 hvy. melting	77.00 to	80.00
No. 1 dealer bundles	102.00 to	105.00
No. 2 dealer bundles	60.00 to	63.00
No. 1 busheling	107.00 to	110.00
Shredder scrap	100.00 to	103.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 tc	32.00
Shoveling turnings	48.00 to	51.00
Low phos. 5 ft. and under	102.00 to	105.00
Low phos. 2 ft. punchings	120.00 to	123.00
Electric furnace bundles	117.00 to	120.00
RR specialties	107.00 to	110.00
Rails, 2 ft. and under	122.00 to	125.00
Cupola cast	73.00 to	76.00
Heavy breakable cast	55.00 to	57.00
No. 1 machinery cast	99.00 to	102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to	$ 72.00
No. 2 hvy. melting	68.00 to	69.00
No. 1 dealer bundles	95.00 to	96.00
No. 2 bundles	47.00 to	48.00
No. 1 busheling	94.00 to	95.00
Drop forge flashings	68.00 to	69.00
Machine shop turn.	35.00 to	36.00
Mixed borings and turn.	22.00 to	23.00
Shoveling turnings	35.00 to	36.00
Cast iron borings	44.00 to	45.00
Heavy breakable cast	35.00 to	36.00
Mixed cupola cast	51.00 to	52.00
Automobile cast	74.00 to	75.00
Stainless		
18-8 bundles and solids	480.00 to	490.00
18-8 turnings	370.00 to	380.00
430 bundles and solids	130.00 to	140.00

Youngstown

No. 1 hvy. melting	$ 89.00 to	$ 92.00
No. 2 hvy. melting	69.00 to	72.00
No. 1 dealer bundles	103.00 to	106.00
No. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	14.00 to	17.00
Shoveling turnings	19.00 to	22.00
Low phos. plate	96.00 to	99.00
Electric furnace bundles	91.00 to	94.00
Galvanized bundles	85.00 to	88.00

Cleveland

No. 1 hvy. melting	$ 82.00 to	$ 85.00
No. 2 hvy. melting	50.00 to	53.00
No. 1 dealer bundles	100.00 to	103.00
No. 1 factory bundles	103.00 to	106.00
No. 2 bundles	25.00 to	28.00
No. 1 busheling	99.00 to	102.00
Machine shop turn.	13.00 to	16.00
Mixed bor. and turn.	13.00 to	16.00
Shoveling turnings	15.00 to	18.00
Cast iron borings	18.00 to	21.00
Cut structural & plates, 2 ft. and under	117.00 to	120.00
Low phos. punchings plate	117.00 to	120.00
Drop forge flashings	62.00 to	65.00
Foundry steel, 2 ft. & under	70.00 to	75.00
No. 1 RR hvy melting	87.00 to	90.00
Rails, 2 ft. and under	117.00 to	120.00
Rails, 18 in. and under	118.00 to	121.00
Steel axle turnings	67.00 to	70.00
Railroad cast	94.00 to	97.00
No. 1 machinery cast	97.00 to	100.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 77.00 to	$ 78.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 busheling	87.00 to	88.00
No. 1 dealer bundles	88.00 to	89.00
No. 2 bundles	40.00 to	41.00
Machine shop turn.	15.00 to	16.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	20.00 to	21.00
Cast iron borings	20.00 to	21.00
Low phos. plate	91.00 to	92.00
Structural and plate, 2 ft. and under	95.00 to	96.00
Rails, 2 ft. and under	97.00 to	98.00
Scrap rails, random lgth.	77.00 to	78.00
No. 1 machinery cast	75.00 to	76.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 82.00 to	$ 83.00
No. 2 hvy. melting	71.00 to	72.00
Foundry steel, 2 ft.	71.00 to	72.00
No. 1 dealer bundles	82.00 to	83.00
No. 2 bundles	68.00 to	69.00
Machine shop turn.	22.00 to	23.00
Shoveling turnings	29.00 to	30.00
Cast iron borings	40.00 to	41.00
No. 1 RR hvy. melting	92.00 to	93.00
Rails, random length	86.00 to	87.00
Rails, 18 in. and under	102.00 to	103.00
RR specialties	95.00 to	96.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	53.00 to	54.00
Stove plate	85.00 to	86.00
Cast iron car wheels	57.00 to	58.00
Rerolling rails	102.00 to	103.00
Unstripped motor blocks	64.00 to	65.00

Birmingham

No. 1 heavy melting	$ 80.00 to	$ 81.00
No. 2 heavy melting	74.00 to	75.00
No. 1 dealer bundles	85.00 to	86.00
No. 2 bundles	60.00 to	61.00
No. 1 busheling	84.00 to	85.00
Shredder scrap	105.00 to	106.00
Machine shop. turn.	39.00 to	40.00
Shoveling turnings	48.00 to	49.00
Cast iron borings	45.00 to	46.00
Electric furnace bundles	74.00 to	75.00
Elec. furnace, 3 ft. & under	79.00 to	80.00
Structural and plate, 2 ft.	109.00 to	110.00
Structural and plate, 4 ft.	109.00 to	110.00
No. 1 RR hvy. melting	109.00 to	110.00
Scrap rails, random lgth.	101.00 to	102.00
Rails, 18 in. and under	117.00 to	118.00
Angles and splice bars	109.00 to	110.00
No. 1 cupola cast	95.00 to	96.00
Unstripped motor blocks	80.00 to	81.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 75.00 to	$ 76.00
No. 2 hvy. melting	68.00 to	69.00
No. 1 dealer bundles	88.00 to	89.00
No. 2 bundles	44.00 to	45.00
Machine shop turn.	15.00 to	16.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	27.00 to	28.00
Low phos. 18 in. and under	113.00 to	114.00
Rails, random length	91.00 to	92.00
Rails, 2 ft. and under	107.00 to	108.00
No. 1 cupola cast	80.00 to	81.00
Heavy breakable cast	41.00 to	42.00
Drop broken cast	93.00 to	94.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 46.00 to	$ 47.00
No. 2 hvy. melting	40.00 to	41.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	500.00 to	520.00
18-8 turnings	400.00 to	420.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 62.00 to	$ 64.00
No. 2 hvy. melting	52.00 to	54.00
No. 1 dealer bundles	76.00 to	78.00
No. 2 bundles	40.00 to	42.00
No. 1 busheling	80.00 to	82.00
Shredder scrap	78.00 to	80.00
Machine shop turn.	12.00 to	14.00
Shoveling turnings	18.00 to	20.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	47.00 to	49.00
Heavy breakable cast	18.00 to	20.00

San Francisco

No. 1 hvy. melting	$ 48.00 to	$ 50.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	36.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	76.00 to	78.00

Los Angeles

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	40.00 to	42.00
No. 1 dealer bundles	39.00 to	40.00
No. 2 dealer bundles	19.00 to	21.00
Machine shop turn.	6.00 to	8.00
Shoveling turnings	10.00 to	12.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	75.00 to	77.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 73.00 to	$ 75.00
No. 2 hvy. melting	62.00 to	64.00
No. 2 bundles	42.00 to	44.00
No. 1 cupola cast	98.00 to	100.00
Mixed yard cast	85.00 to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 82.00
No. 2 heavy melting cut 2 ft. and under	77.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	40.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	68.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 87.00 to	$ 88.00
No. 2 hvy. melting	71.00 to	72.00
No. 2 bundles	44.00 to	45.00
Machine shop turn.	23.00 to	24.00
Crushed turnings	47.00 to	48.00
Shredder scrap	87.00 to	88.00
Cut structural plate 2 ft. and under	94.00 to	96.00
Unstripped motor blocks	62.00 to	63.00
Cupola cast	86.00 to	87.00

PRODUCER KEY
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P13	Penn Dixie Steel Corp., Kokomo, Ind.
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	25.00	30.96	31.78	31.07	22.91	23.45	18.58	31.44	34.34	50.60	69.58	73.19
Baltimore	25.72	30.36	36.58	40.02	28.03	28.10	20.86	38.10	56.93	64.92	71.71	75.93
Birmingham	21.90	31.94	32.06	31.12	22.43	24.77	18.68	30.94	49.31	68.90	68.16	74.43
Boston	30.28	34.98	38.72	45.18	32.96	30.04	21.20	36.15	46.35	53.12	62.70	65.60
Buffalo	28.01	34.45	39.13	40.89	30.94	27.55	18.52	37.20	40.10	47.82	55.33	60.11
Chicago	27.40	32.86	35.53	31.18	23.27	23.88	16.93	32.73	36.08	40.45	45.39	51.08
Cincinnati	26.32	31.88	34.49	30.09	23.18	24.34	16.65	30.75	36.03	40.33	45.58	50.75
Cleveland	27.27	33.08	34.78	33.98	24.20	25.09	17.90	32.31	36.64	40.98	44.02	50.75
Denver	33.55	39.20	39.36	36.89	31.85	28.45	20.43	45.41	49.83	60.27	68.31	75.60
Detroit	27.17	33.31	36.11	32.71	25.31	25.95	17.40	31.66	36.14	40.44	45.84	55.47
Houston	30.75	35.57	39.76	43.81	30.71	27.97	22.03	42.44	47.15	53.78	59.26	64.61
Kansas City	27.91	32.66	36.70	48.19	25.50	28.28	18.18	34.59	42.39	47.57	53.50	65.04
Los Angeles	28.22	34.66	38.45	48.58	33.36	36.24	29.34	40.58	57.47	65.04	71.25	74.68
Memphis	25.07	31.39	33.06	33.37	25.89	27.30	18.99	34.76	36.78	49.96	59.80	69.44
Milwaukee	27.33	33.21	35.02	30.89	23.37	23.32	16.43	31.22	35.57	41.53	44.87	55.07
New York	28.31	35.22	39.44	45.47	31.43	28.12	20.17	41.14	46.00	51.91	61.12	68.72
Philadelphia	28.80	33.98	39.38	44.20	31.75	28.51	19.74	39.64	46.31	54.81	65.15	70.83
Pittsburgh	31.07	37.29	40.06	42.61	33.96	29.51	20.41	31.80	46.10	53.08	60.27	68.22
Portland	25.66	32.00	38.17	31.11	31.04	34.76	27.50	44.85	49.73	57.74	70.44	....
San Francisco	28.75	34.89	38.60	48.50	33.96	29.92	25.60	41.59	59.18	67.87	74.44	82.67
Seattle	23.96	28.33	34.68	34.27	22.24	27.49	24.66	40.73	54.41	71.57	75.28	81.67
Spokane	21.00	30.34	34.28	37.91	33.00	33.75	21.60	43.01	43.20	47.52	....	58.32
St. Louis	27.11	32.85	35.09	32.25	24.89	22.86	17.16	33.26	37.68	42.41	49.84	53.36
St. Paul	26.61	30.79	33.85	36.25	25.14	23.92	17.00	33.42	36.16	41.16	45.76	52.07

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 71. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A. = Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	21.45
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	33.60
Midwest	
I4	35.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, I4, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
I4	23.70
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	41.80
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	21.15
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	**per base box**
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7	23.95
U1, I3, I4, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	31.00
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	24.85
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3, O2	25.75
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	33.55
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRICES CONTINUE THEIR SLOW CLIMB

Producer prices in December continued the moderate pace they have followed through much of 1983.

December prices rose only 0.2 pct from November. That follows a 0.2 pct decline in prices of finished goods in November, but was in line with the average monthly increase since May. The index of intermediate product prices, those used in various stages of production, showed no change after rising slightly in October and November.

Crude material prices rose 1.1 pct, mainly reflecting increases in iron and steel, natural gas, and iron and steel scrap. These prices, which have posted a 15.8 pct increase for 1983 compared with 1982, are frequently considered an important indicator of future production costs.

Prices of passenger vehicles and heavy motor trucks showed virtually no change in December. The light trucks category was down 0.3 pct.

Capital equipment prices showed little change in December. Prices rose for metal cutting and metal forming machine tools as well as industrial process furnaces and railroad equipment. Construction and farm machinery, and fluid power equipment prices were unchanged from November levels.

A look at the figures for December show that only one category—light motor trucks—was down compared with November. Eleven were unchanged; the remaining 10 were up, with the increases ranging from 0.1 pct to 1.6 pct for metal forming machine tools.

The U.S. Bureau of Labor Statistics' figures put the producer price increases for 1983 up by the smallest increment in 20 years. A 10 pct drop in gasoline prices and a 15.8 pct fall in heating oil costs helped to keep the lid on inflation in the past year.

The 0.6 pct unadjusted rise from December 1982 to December 1983 was a moderate pace when compared to a 3.7 pct increase in 1982 and 7.1 pct boost in 1981.

Latest Month Covered: December, 1983

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	379.3	+ 0.6	+ 1.9
Metal Forming Machine Tools	422.6	+ 1.6	+ 2.7
Agricultural Machinery & Equip.	329.8	0	+ 2.8
Construction Machinery & Equip.	353.7	0	+ 1.6
Industrial Process Furnace & Ovens	369.1	+ 0.2	+ 3.5
Industrial Material Handling Equip.	286.5	+ 0.2	+ 0.1
Pumps, Compressors & Allied Equip.	346.3	+ 0.3	− 0.6
Fluid Power Equip. (Dec. 1970 = 100)	254.3	0	+ 1.9
Mechanical Power Transmission Equip.	320.4	+ 0.5	+ 2.7
Automobiles	222.0	0	+ 1.3
Motor Trucks—Light	280.0	− 0.3	+ 1.7
Motor Trucks—Heavy	317.7	0	+ 0.1
Railroad Equipment	357.3	+ 0.5	+ 1.9
Fabricated Metal Structural Products	304.9	0	+ 0.1
Electric Motors	336.0	+ 0.1	+ 5.9
Valves & Fittings	100.1	0	+ 0.1
Ball & Roller Bearings	333.2	0	− 0.6
Cutting Tools & Accessories	275.8	0	+ 1.3
Heating Equipment	245.6	+ 0.2	+ 2.6
Plumbing Fixtures & Brass Fittings	293.6	0	+ 5.2
Metal Containers	338.2	0	+ 3.0
Miscellaneous Metal Products	289.3	+ 0.1	+ 2.2

Data based on U.S. Labor Dept.'s Producer Price Index

CHILTON'S

IRONAGE METALS PRODUCER

February 20, 1984

WORLD STEEL FINANCING:

BUILDING ON GREAT EXPECTATIONS

IN PLANT SPOTLIGHT: INSIDE BETHLEHEM'S CONTINUOUS CASTING PROJECT

THE HOT SPOT: DEBATING THE 201 AGREEMENT

MANNESMANN MOVES TO MINI-MILL EFFICIENCY

FEBRUARY 20, 1984 VOL. 227, NO. 4

CHILTON'S IRONAGE METALS PRODUCER

Editorial 7
They should get a medal!

Newswatch 13
Nucor's next move: Could it be flat-rolled products?

You and Your Job 18
More ousted execs will have softer landings.

The Hot Spot 23
Bethlehem Steel and USWA want import quotas.

World Steel Financing 26
Building on great expectations.

Mannesmann Revamps Mill Capabilities 32
Process control and instrumentation emphasized.

USS' Plan to Buy National Steel 35
Combining the two would avert duplicate facilities.

Management Challenge 42
Manufacturing control systems are shaking things up.

Brazil's Tubarão Iron and Steel Complex 59
Italimpianti is largely responsible for this giant.

In-Plant Spotlight 67
Inside Bethlehem's continuous casting project.

Technically Speaking 69
Laser beam routing by fiber optics.

Materials Report 93
U.S. Steel picks a good time to buy National Steel.

Order Trends 100
Orders are rising at a slower pace.

Next Issue: Rotary Forge Mills.

Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 21
INDUSTRIAL BRIEFS 22
PERSONNEL TOUCH 72
PRODUCT & EQUIPMENT REVIEW 75
AD INDEX 90
MANAGEMENT SERVICE CARD 91
BUSINESS STAFF 92
P&P DATA 2/6 96
FERROUS SCRAP 2/6 97
CLEARING HOUSE 98

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

Chilton abc

WORLD STEEL FINANCING

BUILDING ON GREAT EXPECTATIONS

Outside money is available on liberal terms and technology is providing opportunities for investments.

The world steel industry is starting to build on expectations.

Major capital programs are going forward entirely on the basis of expected future returns. The gap between the grim present and a brighter future is being bridged entirely by debt.

There is no shortage of lenders. In order to sell equipment, foreign sources are offering low interest loans, sometimes unsecured, with flexible repayment schedules.

Prime examples of the new approach are the big casting programs of Bethlehem Steel Corp. (see article beginning on page 67) and Inland Steel Co. Both companies are borrowing all their capital. In both cases, repayment starts only when machines are producing steel and savings.

Similar proposals have been made for the new continuous caster of Rouge Steel Co. Reportedly coming up are casters for the Gary Works of United States Steel Corp. and the Great Lakes Works of United States Steel Corp.

All this is a break from traditional spending patterns. To a considerable extent, steel spending has always been governed by past returns. When steel profits doubled in 1975, steel spending rose 50 pct in 1975.

To a large extent, steel projects have been paid for out of internal cash generation-past and current. From 1970 through 1981, the steel industry invested $30 billion. In that period, the industry's long term debt rose only $2.2 billion. At the start of 1982, debt represented only 30 pct of invested capital.

This is in sharp contrast to the course followed by Japan's steel industry. The Japanese have borrowed heavily against expectations. This practice has produced dynamic growth, modern facilities, and a capital structure with 80 to 90 pct debt.

With sluggish growth and highly cyclical markets, American producers have probably been wise to follow more conservative policies. Had they been top heavy with debt, high interest rates could literally have killed major mills in the deep recession of 1982 and 1983.

However, the same recession provided an extreme example of a long standing steel problem. There was no internal cash in 1982. The industry had a negative cash flow of $391 million. Steel companies obviously were in no position to carry out vigorous modernization programs.

The 1982 situation was extreme but not unique. Over the years, the steel industry's cash generation has fallen far short of capital needs. A 1980 study by the American Iron & Steel Institute (AISI) concluded that the industry should be spending $4.4 billion a year for replacement and modernization.

Since the start of 1979, spending for steel operations has run around $2.5 billion a year. Total capital spending has been greater but a growing portion of this has gone to diversified operations.

Failure to Modernize

The effect has been to create a vicious circle. The mills haven't been making enough profit to modernize. The failure to modernize has held down profits.

Now there is a move to burst out of the circle by making greater use of other people's money. Outside money is available on liberal terms, and new technology is providing opportunities for attractive investments. There is an awareness that the industry can't just drift along with business-as-usual policies; modernization is a must.

In any event, there is a new spirit of boldness or recklessness or desperation. "You have companies coming out of bankruptcy wanting off-the-balance sheet financing," said George M. Baughman, president of Mannesmann Demag Wean. "They want Bethlehem or better regardless of their ability to pay."

As has been indicated, the pattern established at Bethlehem and Inland calls for 100 pct borrowing with payments deferred until machines begin operating. At Inland, fixed payments are specified. In the Bethlehem project, payments are tied to the tonnage produced by casters; there is no floor under the deal.

"If there isn't sufficient production, the participants might not get paid back," said Robert C. Wilkins, Bethlehem's finance vice president.

As this suggests, the boldness of the steel companies is matched by the generosity of lenders. "There's plenty of money available," said Mr. Wilkins. "Despite Washington's talk of a credit crunch," he indicated, "there are willing lenders in this country and abroad."

This willingness, along with imaginative use of the tax laws, has made it possible to minimize money costs. In leasing agreements, payments are reduced by transferring tax benefits. The outright sale of tax benefits is another offset for the profitless steel companies.

Particularly willing and eager to lend money are foreign companies. For Bethlehem's program, $190 million is coming from Austrian banks. In this situation and others like it, financing is tied to the purchase of equipment abroad. Bethlehem's casters are being built by Voest-Alpine, a steel producer and equipment company owned by the Austrian government.

"Viewed from the perspective of history, the foreign aid is only fitting," said Klaus Czempirek, executive vice president of Voest-Alpine. "We financed our modernization and the expansion of our Linz plant with funds of the Marshall Plan," said Dr. Czempirek.

These words are appropriate because something like a reverse Marshall Plan is now operating. The two continuous casters recently started at Wheeling-Pittsburgh Steel Corp. were purchased through Mitsubishi Corp. Mitsubishi's financing reportedly covered not just equipment but the whole construction package.

Mitsubishi is also involved in the $200 million continuous casting program recently launched by Inland Steel Co. Unlike Bethlehem, Inland will be making flat payments. Like Bethlehem, Inland will start paying only when steel is being cast.

As has been said, the availability of foreign financing is linked to the sale of foreign equipment. Wheeling-Pittsburgh's casters came from Hitachi Zosen Corp. of Japan and Mannesmann Demag of West Germany.

The big slab caster started in December at the Indiana Harbor Works of Jones & Laughlin Steel Corp. was supplied by a consortium of Concast, Inc., and Sumitomo Metal Industries, Ltd.

Most of the casting equipment for Inland's project is coming from Hitachi Zosen and from Mannesmann Demag in Germany. Republic's slab caster at Cleveland came from Mannesmann Demag.

Buying Foreign

In explaining why they are buying foreign equipment, domestic producers have a simple answer. "...continuous casting equipment technology is just not available here in the United States," said Walter F. Williams, president of Bethlehem.

"Even at that," added Mr. Williams, "less than 30 pct of the total project cost will be spent for foreign-supplied equipment."

Finance people are still mulling the terms of the Bethlehem program. "It's either the most ingenious financing deal ever devised or the most unnecessarily complex," said one executive.

The deal was complicated enough to require considerable working out. "There were times when we thought the casters might be completed before the paperwork," said Mr. Wilkins.

On Dec. 1, however, Bethlehem announced that all elements were in place. As explained by Mr. Wilkins, the general arrangement is this:

The total cost, with capitalized interest, will be $540 million. An owner trust will borrow the money. Bethlehem will be the general contractor and will lease the casters from the trust when the project is finished. Payments will then be based on usage.

"Simply put, the more tons we produce, the more we pay — and vice versa," said Mr. Wilkins. "There is, however, an upper limit on the total annual payment."

The payments are expected to cease after 10 years but could extend to 15 years. Bethlehem has an option to buy the casters at the end of 15 years at a fixed price.

Potential equity participants in the financing are Chemical Bank; Bankers Trust Co.; and Morgan Guaranty Trust Co. of New York. Morgan is a co-agent.

A second group of six North American banks is participating in the debt portion of financing. Also lending money — $190 million — are Austrian banks, including the country's export bank.

The Bethlehem financial package is not secured by any collateral. Inland

Factors Determining Test Discount Rates

In a recent report, the International Iron and Steel Institute (IISI) described the methods used to evaluate steel investments in different countries. The report was based on a survey of 63 companies in 29 countries.

The strong influence of financing costs was shown by replies to a question which asked companies to rank investment factors in order of importance.

Country	Weighted Average Cost of Capital		Current Interest on Borrowings		Future Interest on Borrowings	
	No.	Pct.	No.	Pct.	No.	Pct.
Europe	11	57.9	13	68.4	9	47.4
N. America	11	84.6	9	69.2	7	53.8
Japan	5	55.6	3	33.3	4	44.4
L. America	6+	66.7	6	66.7	5	55.6
Others	6	75.0	5	62.5	3	37.5
TOTAL	**39**	**67.2**	**36**	**62.1**	**28**	**48.3**

said the same thing is true of its financing, but the company has provided few details on the transaction. Industry sources said that at least some portions of the deal are covered by guarantees.

In any event, both projects are based ultimately on the confidence of all parties that the casters will pay for themselves with something to spare.

"We will base load our casters," said an Inland official. That means the machines will have high utilization rates even in very weak markets.

There is every reason to believe continuous casting will justify the confidence of lenders and borrowers. However, there is not quite the same level of assurance that went into the financing of U.S. Steel's new seamless mill at Fairfield, Ala. There, the borrowing was underwritten by take-or-pay commitments of customers.

Take-or-Pay

The joint iron ore ventures were financed in a similar manner — by take-or-pay contracts of participants. These proved a source of great sorrow to the mills when the steel market collapsed in 1982.

In the casting ventures, assurance is provided by the well-documented superiority of a process. "Continuous casting makes possible higher yields, energy and other cost savings," said Mr. Wilkins of Bethlehem. "These savings amount to about $35 to $40 on each ton — more than double the amount required to finance them."

Analyst John C. Tumazos of Oppenheimer & Co. said, the Inland project would be less expensive. On the basis of probable production, said Mr. Tumazos, Inland's payments would work out to no more than $10 a ton.

While such words as project financing, leverage leasing, and off-the-balance sheet financing are used to describe the new ways of raising money, they all constitute a form of borrowing.

"It's all debt," said Mr. Wilkins. "The $540 million being put up by the banks is all borrowed money as far as we're concerned. All the money has to be repaid."

Does this mean U.S. producers are prepared to emulate the Japanese and go to highly leveraged structures? Not really, Mr. Wilkins indicated.

"This is just a portion of what we will be spending in a five year period," he said.

With other projects financed along more conventional lines, Bethlehem and others will keep their debts to manageable dimensions. It's doubtful, for example, that anyone would attempt to finance a coke battery with 100 pct borrowing.

There are, however, areas where some bold financing might be in order. ASEA, Inc., reported that the new controls it installed on a bar mill at Chaparral Steel Co. paid for themselves in three or four months. According to suppliers, water-cooled panels for electric furnaces have a one month payback.

There are other favorable opportunities, but among the major facilities, continuous casting is unique in that it saves enough to justify investments strictly on a replacement basis.

Bootstrap Operation

To realize the saving, the mills have mounted a massive boostrap operation. Bethlehem's $540 million project will provide a 2.9 million ton slab caster at Sparrows Point by January, 1986, and a 2.2-million-ton slab caster at Burns Harbor by April of 1986.

These will be in addition to the slab caster now operating at Burns Harbor and the big bloom caster recently started at Steelton, Pa.

"When all four casters are in operation," said Mr. Williams, "Bethlehem will be casting 60 to 65 pct of its semifinished steel requirements."

Sparrows Point will have two casting machines, each capable of casting single widths up to 86 in. wide or double widths up to 37 in. wide.

Burns Harbor is getting a single two-strand machine. Casting widths will be the same as at Sparrows Point but only one strand will be able to cast double widths.

The Voest-Alpine casters will have straight molds. Slabs will be bent below the molds while the cores are still liquid. At one time, all casters had straight molds. In order to reduce machine height and cost, the curved mold was introduced and has become standard.

In explaining why it has stayed with the straight design, Voest-Alpine points out that impurities can be trapped when they float upward in a curved mold.

Robert C. Wilkins (top) vice president of finance for Bethlehem explains the financing arrangement for the company's continuous casters built by Voest Alpine and illustrated below in a working model.

VOEST-ALPINE

This was a problem when curved molds were first used on big slab machines. The problem has since been minimized by cleanliness in steelmaking.

Other advantages cited for the straight mold are easy alignment and even heat transfer. Uniform cooling is considered particularly critical in high speed casting. The Bethlehem machines are being built to cast slabs up to 10 in. thick at speeds up to 67 ipm.

"That permits casting of critical grades of steel that have demanding quality requirements," said Mr. Williams of the high speed.

The casters will have large tundishes, capable of holding 70 tons. The large size is seen promoting cleanliness. The machines will be equipped with variable width molds. Width changes will be made on the fly, permitting the good utilization which is particularly important under the tolling arrangement.

"...these casters represent a giant step forward toward Bethlehem's goal of being the best domestic producer in terms of productivity, quality and service," said Mr. Williams.

Bethlehem makes the point that most of the spending for the casters will go to domestic suppliers. Construction engineering is coming from United Engineers and Constructors, Inc., of Philadelphia. Fifteen overhead cranes will be made in the U.S. Bethlehem will serve as its own general contractor.

Voest-Alpine is supplying the caster design engineering. The two elements — design and manufacturing — don't necessarily come from the same supplier. It's possible to buy design engineering from a foreign company and have the equipment built in the U.S.

License Agreements

"The technology is available in this country by way of license agreements," said R.J. Wean, Jr., chairman of Wean United, Inc. Under license to Concast, Inc., Wean United built the slab casters at the Great Lakes and Granite City plants of National Steel Corp. The company is now aligned with Mannesmann Demag.

U.S. manufacture was used for most of the equipment going into the bloom casters supplied by Mannesmann Demag to U.S. Steel at Lorain, Ohio, and Bethlehem at Steelton.

Concast now works with E.W. Bliss when domestic manufacture is specified. Bliss, which is now an independent company, built the caster at Kaiser Steel Corp. and was involved in the rebuilding of U.S. Steel's caster at Gary.

Voest-Alpine is just entering the American casting market, but the company will provide domestic manufacture if the customer wants it.

"The price might be a little different," said an official.

The equipment price might be different and the financing terms would certainly be different with American manufacture. "If you're looking at an export package, you're probably taking 8 to 12 pct," said Benno F. Kialka, commercial manager for Mannesmann Demag Wean. With domestic financing, he indicated, interest runs from 11 to 15 pct.

While the financing is tied to equipment sales, the actual working out of money terms will often be done separately. A price will be set by the equipment company and the financing will then be arranged by a trading company or bank.

Mitsubishi has been involved in a number of recent programs. "At this moment, there are two things the U.S. can enjoy from Japan," said a Mitsubishi official. "One is excellent machinery. The second thing is good, long term interest rates."

In the Bethlehem project, domestic banks are lending a major portion of the money. Domestic equipment people were surprised to hear this. Their own efforts to match foreign financing has been discouraging.

The Bethlehem project has a floating interest rate. In estimating money costs, Bethlehem is assuming a rate of 12 pct. Mr. Wilkins says a similar financing package could have been put together entirely with domestic sources.

The focal point for steel equipment and their bankers is Pohang Iron and Steel Co., Ltd., of South Korea.

The 3 million ton integrated mill planned by Pohang is the only steel expansion of this magnitude underway in the world.

The American portion of $2.5 billion project is apparently down to a possible $30 million. The U.S. Export-Import Bank had indicated it will provide loan guarantees for that amount if Dravo Corp. and Air Products and Chemicals, Inc., are successful bidders.

Another $40 million guarantee was scheduled to go to General Electric Co., but GE lost out to foreign suppliers in its bid for electrical equipment at Pohang.

A spokesman for the Ex-Im Bank defended the offering of guarantees, noting that the great bulk of the Korean project was being financed by its counterparts in Japan, the United Kingdom, West Germany, and Austria.

In recent fiscal years, the steel related projects supported by the Ex-Im Bank have totaled: 1979-$330 million; 1980-$87.6 million; 1981-$505.8 million; 1982-$11.8 million; 1983-$7.2 million.

Many American suppliers considered the financial competition too fierce to even bid on Pohang. Equipment people said the outlook for foreign sales was bleak. With other countries offering the most liberal financing terms, they said, the U.S. Ex-Im Bank has been subjected to tighter control.

Under legislation passed last year, there must be a feasibility study before credits or loan guarantees are offered for a foreign project.

"Between the financing and the strong dollar, it's very difficult," said one supplier.

The difficulties are increased by the very limited amount of steel mill construction throughout the world. Wean United, Inc., is building a pickling line for Dofasco, Inc. It's expected Dofasco will turn loose a cold mill for sheet some time this year.

Various attempts have been made to curb overly generous international financing. The International Monetary Fund is due to increase its interest rates May 1 of this year. Last year, the OECD Export Credit Group supposedly set subsidy limits on all financing.

None of these steps seem to have ended the bargain credit terms. Recent loans for steel projects in Mexico and India have reportedly called for no interest at all.☐

Reprints available while supply lasts. For single copy, circle No. 98 on inquiry card. Additional copies: $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE Reader Service, Chilton Way, Radnor Pa. 19089. Ask for reprint No. 4466.

Change in Long-Term debt
(millions of dollars)

Year	Amount
1970	+ $526
1971	+ 10
1972	+ 85
1973	− 267
1974	− 312
1975	− 1,054
1976	+ 1,262
1977	+ 992
1978	+ 804
1979	− 46
1980	+ 659
1981	− 431
1982	+ 5,715
TOTAL	**+$2,228****

**Does not include 1982 Source: AISI

Net Internal Sources
(millions of dollars)

Year	Amount
1970	$1,172
1971	1,296
1972	1,589
1973	2,158
1974	3,354
1975	2,528
1976	2,314
1977	1,355
1978	2,709
1979	3,014
1980	3,265
1981	5,376.8
1982	(381)
TOTAL	**$30,130.8****

**Does not include 1982 Source: AISI

Capital Expenditures
(millions of dollars)

Year	Amount
1970	$1,736
1971	1,425
1972	1,174
1973	1,400
1974	2,115
1975	3,179
1976	3,253
1977	2,650
1978	2,595
1979	3,512
1980	3,319
1981	3,365
1982	4,219
TOTAL	**$29,723****

**Does not include 1982 Source: AISI

PRICE & PRODUCTION DATA

(Effective February 6, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	237	212	145	163
Buffalo	10	10	7	34
Pittsburgh	265	243	172	166
Youngstown	114	114	76	89
Cleveland	146	135	116	90
Detroit	150	143	101	119
Chicago	565	557	331	393
Cincinnati	94	97	66	74
St. Louis	76	83	39	56
Southern	196	194	132	113
Western	81	78	66	61
U.S. Production	1,934	1,868	1,251	1,358

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..........gross-ton 80.50-86.9*
Mesabi, regular-unscreened ....gross-ton $32.53
Mesabi, non-bessemer............... gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective February 6, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,934	1,868	8,963	6,284
Capability Utilization Rate	74.8	72.3	69.4	43.4

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.954
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 95.17	$ 95.17	$ 90.50	$ 67.50
No. 2 bundles	$ 61.17	$ 60.83	$ 58.50	$ 47.83

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh .	$103.50	$103.50	$ 96.50	$ 69.50
No. 1 steel, Philadelphia ..	91.50	91.50	89.50	61.50
No. 1 steel, Chicago.........	90.50	90.50	85.50	71.50
No. 1 bundles, Detroit	101.50	101.50	86.50	61.50
Low Phos., Youngstown	104.50	97.50	88.50	69.50
No. 1 mach'y cast., Pgh...	79.50	79.50	79.50	66.50
No. 1 mach'y cast., Phila	100.50	100.50	97.50	98.50
No. 1 mach'y cast., Chi..	111.50	111.50	115.50	109.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective February 6, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	68.00-69.00	67.00-69.00	2/3/84
Lead	24.00-28.00	25.00-28.00	1/16/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	51.00	49.00-51.00	1/10/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas .	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$380.80
Indium, dollars per troy oz.	$2.43-$2.65
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y. ..	$298-$350
Molybdenum, lb. tech. moly • oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.88
Vanadium	$6.00
Zirconium sponge................	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Jan. 30—567.37
Jan. 31—564.99
Feb. 1—565.52
Feb. 2—Holiday
Feb. 3—Holiday

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	61⅛	60
Yellow brass	57	57
Red brass	58	58
Comm. bronze	58¼	58¼
Mang. bronze..................	59¾	57¾
Free cutting rod ends......	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire.........................	61
No. 2 copper wire.........................	52
Light copper..................................	43

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire.........................	57
No. 2 copper wire.........................	48
Light copper..................................	39
No. 1 composition	52
No. 1 comp. turnings.....................	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings............	28
Radiators.......................................	42

Aluminum

New mixed clips	52	—53
Old sheet................................	50	—51
Old cast..................................	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings.............	41	—42
Mixed L.C. clips......................	37	—38
Old sheets and cast	35	—36
Borings and turnings.............	26	—27
Duraluminum clippings..........	28	—29

Copper and Brass

No. 1 copper wire..................	48	—49
No. 2 copper wire..................	40	—41
Light copper...........................	36	—37
Radiators................................	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs.....	40	—41
Cocks and faucets..................	28	—29
Clean heavy yellow brass	25	—26
Brass Pipe	28	—29
New soft brass clippings.......	41	—42

Lead

Heavy soft lead......................	8	— 9
Whole batteries......................	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids...........................	110	—120
Nickel rod ends......................	110	—120
Nickel sheets, clips................	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings.................	15	— 16
Old diecast zinc	10	— 11

EFFECTIVE FEB. 6, 1984

(Effective February 6, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$103.00	to	$104.00
No. 2 hvy. melting	93.00	to	94.00
No. 1 dealer bundles	122.00	to	123.00
No. 1 factory bundles (auto)	129.00	to	130.00
No. 2 bundles	59.00	to	60.00
No. 1 busheling	123.00	to	124.00
Machine shop turn.	16.00	to	17.00
Shoveling turnings	54.00	to	55.00
Cast iron borings	53.00	to	54.00
Low phos. punchings plate	127.00	to	128.00
Heavy turnings	93.00	to	94.00
No. 1 RR hvy. melting	119.00	to	120.00
Rail[illegible] ft. and under	125.00	to	126.00
Scr[illegible]ils, random lgth.	109.00	to	110.00
RR specialties	124.00	to	125.00
No. 1 machinery cast	79.00	to	80.00
Cupola cast	72.00	to	73.00
Heavy breakable cast	30.00	to	31.00
Stainless			
18-8 bundles and solids	610.00	to	615.00
18-8 turnings	510.00	to	515.00

Chicago

No. 1 hvy. melting	$ 90.00	to	$ 91.00
No. 2 hvy. melting	84.00	to	85.00
No. 1 dealer bundles	114.00	to	115.00
No. 1 factory bundles (auto)	117.00	to	118.00
No. 2 dealer bundles	62.00	to	63.00
No. 1 busheling	114.00	to	115.00
Shredder scrap	103.00	to	104.00
Machine shop turn.	49.00	to	50.00
Mixed bor. and turn.	50.00	to	51.00
Shoveling turnings	60.00	to	61.00
Cast iron borings	61.00	to	62.00
Low phos. forge crop	120.00	to	121.00
Low phos. punchings plate ¼ in. and heavier	130.00	to	131.00
Low phos. 2 ft. and under	125.00	to	126.00
No. 1 RR hvy. melting	109.00	to	110.00
Scrap rails, random lgth.	102.00	to	103.00
Reroller rails	112.00	to	113.00
Rails, 2 ft. and under	125.00	to	126.00
RR couplers and knuckles	108.00	to	109.00
RR car axles	129.00	to	130.00
No. 1 machinery cast	111.00	to	112.00
Cupola cast	105.00	to	106.00
Stove plate	106.00	to	107.00
Steel car wheels	114.00	to	115.00
Stainless			
18-8 bundles and solids	540.00	to	550.00
18-8 turnings	440.00	to	450.00
430 bundles and solids	130.00	to	135.00
430 turnings	95.00	to	100.00

Philadelphia

No. 1 hvy. melting	$ 90.00	to	$ 93.00
No. 2 hvy. melting	77.00	to	80.00
No. 1 dealer bundles	105.00	to	106.00
No. 2 dealer bundles	60.00	to	63.00
No. 1 busheling	107.00	to	110.00
Shredder scrap	100.00	to	103.00
Machine shop turn.	29.00	to	32.00
Mixed bor. and turn.	29.00	to	32.00
Shoveling turnings	48.00	to	51.00
Low phos. 5 ft. and under	105.00	to	108.00
Low phos. 2 ft. punchings	120.00	to	123.00
Electric furnace bundles	120.00	to	123.00
RR specialties	107.00	to	110.00
Rails, 2 ft. and under	122.00	to	125.00
Cupola cast	73.00	to	76.00
Heavy breakable cast	55.00	to	58.00
No. 1 machinery cast	99.00	to	102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00	to	$ 75.00
No. 2 hvy. melting	71.00	to	72.00
No. 1 dealer bundles	101.00	to	102.00
No. 2 bundles	49.00	to	50.00
No. 1 busheling	100.00	to	101.00
Drop forge flashings	72.00	to	73.00
Machine shop turn.	44.00	to	45.00
Mixed borings and turn.	29.00	to	30.00
Shoveling turnings	44.00	to	45.00
Cast iron borings	49.00	to	50.00
Heavy breakable cast	38.00	to	39.00
Mixed cupola cast	54.00	to	55.00
Automobile cast	77.00	to	78.00
Stainless			
18-8 bundles and solids	480.00	to	490.00
18-8 turnings	370.00	to	380.00
430 bundles and solids	130.00	to	140.00

Youngstown

No. 1 hvy. melting	$ 95.00	to	$ 98.00
No. 2 hvy. melting	77.00	to	80.00
No. 1 dealer bundles	108.00	to	111.00
No. 2 dealer bundles	37.00	to	40.00
Machine shop turn.	14.00	to	17.00
Shoveling turnings	19.00	to	22.00
Low phos. plate	103.00	to	106.00
Electric furnace bundles	97.00	to	100.00
Galvanized bundles	94.00	to	97.00

Cleveland

No. 1 hvy. melting	$ 87.00	to	$ 90.00
No. 2 hvy. melting	50.00	to	53.00
No. 1 dealer bundles	106.00	to	109.00
No. 1 factory bundles	109.00	to	112.00
No. 2 bundles	30.00	to	33.00
No. 1 busheling	105.00	to	108.00
Machine shop turn.	13.00	to	16.00
Mixed bor. and turn.	13.00	to	16.00
Shoveling turnings	15.00	to	18.00
Cast iron borings	18.00	to	21.00
Cut structural & plates, 2 ft. and under	123.00	to	126.00
Low phos. punchings plate	123.00	to	126.00
Drop forge flashings	62.00	to	65.00
Foundry steel, 2 ft. & under	70.00	to	75.00
No. 1 RR hvy melting	87.00	to	90.00
Rails, 2 ft. and under	125.00	to	128.00
Rails, 18 in. and under	126.00	to	129.00
Steel axle turnings	67.00	to	70.00
Railroad cast	100.00	to	103.00
No. 1 machinery cast	107.00	to	110.00
Cupola cast	63.00	to	66.00
Stove plate	48.00	to	51.00
Stainless			
18-8 bundles	375.00	to	385.00
18-8 turnings	325.00	to	335.00
430 bundles	80.00	to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 80.00	to	$ 81.00
No. 2 hvy. melting	64.00	to	65.00
No. 1 busheling	92.00	to	93.00
No. 1 dealer bundles	91.00	to	92.00
No. 2 bundles	43.00	to	44.00
Machine shop turn.	15.00	to	16.00
Mixed bor. and turn.	13.00	to	14.00
Shoveling turnings	20.00	to	21.00
Cast iron borings	27.00	to	28.00
Low phos. plate	101.00	to	102.00
Structural and plate, 2 ft. and under	105.00	to	106.00
Rails, 2 ft. and under	97.00	to	98.00
Scrap rails, random lgth.	77.00	to	78.00
No. 1 machinery cast	89.00	to	90.00
No. 1 cupola cast	59.00	to	60.00

St. Louis

No. 1 hvy. melting	$ 87.00	to	$ 88.00
No. 2 hvy. melting	76.00	to	77.00
Foundry steel, 2 ft.	76.00	to	77.00
No. 1 dealer bundles	87.00	to	88.00
No. 2 bundles	73.00	to	74.00
Machine shop turn.	22.00	to	23.00
Shoveling turnings	29.00	to	30.00
Cast iron borings	40.00	to	41.00
No. 1 RR hvy. melting	97.00	to	98.00
Rails, random length	94.00	to	95.00
Rails, 18 in. and under	107.00	to	108.00
RR specialties	100.00	to	101.00
Cupola cast	74.00	to	75.00
Heavy breakable cast	53.00	to	54.00
Stove plate	88.00	to	89.00
Cast iron car wheels	57.00	to	58.00
Rerolling rails	102.00	to	103.00
Unstripped motor blocks	64.00	to	65.00

Birmingham

No. 1 heavy melting	$ 80.00	to	$ 81.00
No. 2 heavy melting	74.00	to	75.00
No. 1 dealer bundles	85.00	to	86.00
No. 2 bundles	60.00	to	61.00
No. 1 busheling	84.00	to	85.00
Shredder scrap	115.00	to	116.00
Machine shop. turn.	41.00	to	42.00
Shoveling turnings	50.00	to	51.00
Cast iron borings	50.00	to	51.00
Electric furnace bundles	75.00	to	76.00
Elec. furnace, 3 ft. & under	79.00	to	80.00
Structural and plate, 2 ft.	114.00	to	115.00
Structural and plate, 4 ft.	110.00	to	111.00
No. 1 RR hvy. melting	110.00	to	111.00
Scrap rails, random lgth.	105.00	to	106.00
Rails, 18 in. and under	117.00	to	118.00
Angles and splice bars	109.00	to	110.00
No. 1 cupola cast	96.00	to	97.00
Unstripped motor blocks	80.00	to	81.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 80.00	to	$ 81.00
No. 2 hvy. melting	73.00	to	74.00
No. 1 dealer bundles	93.00	to	94.00
No. 2 bundles	48.00	to	49.00
Machine shop turn.	17.00	to	18.00
Shoveling turnings	19.00	to	20.00
Cast iron borings	30.00	to	31.00
Low phos. 18 in. and under	115.00	to	116.00
Rails, random length	93.00	to	94.00
Rails, 2 ft. and under	110.00	to	111.00
No. 1 cupola cast	81.00	to	82.00
Heavy breakable cast	42.00	to	43.00
Drop broken cast	95.00	to	96.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 48.00	to	$ 49.00
No. 2 hvy. melting	40.00	to	41.00
No. 2 dealer bundles	23.00	to	27.00
Mixed bor. and turn.	11.00	to	13.00
Machine shop turn.	6.00	to	7.00
Shoveling turnings	14.00	to	15.00
Clean cast. chem. borings	35.00	to	36.00
No. 1 machinery cast	89.00	to	90.00
Mixed yard cast	50.00	to	51.00
Heavy breakable cast	10.00	to	12.00
Stainless			
18-8 prepared solids	500.00	to	520.00
18-8 turnings	400.00	to	420.00
430 prepared solids	90.00	to	110.00
410 solids	80.00	to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 72.00	to	$ 74.00
No. 2 hvy. melting	62.00	to	64.00
No. 1 dealer bundles	80.00	to	82.00
No. 2 bundles	40.00	to	42.00
No. 1 busheling	80.00	to	82.00
Shredder scrap	78.00	to	80.00
Machine shop turn.	14.00	to	16.00
Shoveling turnings	20.00	to	22.00
No. 1 machinery cast	90.00	to	95.00
Mixed cupola cast	48.00	to	50.00
Heavy breakable cast	20.00	to	22.00

San Francisco

No. 1 hvy. melting	$ 50.00	to	$ 52.00
No. 2 hvy. melting	41.00	to	43.00
No. 1 dealer bundles	37.00	to	39.00
No. 2 dealer bundles	19.00	to	21.00
Machine shop turn.	6.00	to	8.00
Cast iron borings	6.00	to	8.00
No. 1 cupola cast	78.00	to	80.00

Los Angeles

No. 1 hvy. melting	$ 52.00	to	$ 54.00
No. 2 hvy. melting	42.00	to	44.00
No. 1 dealer bundles	41.00	to	43.00
No. 2 dealer bundles	21.00	to	23.00
Machine shop turn.	6.00	to	8.00
Shoveling turnings	10.00	to	12.00
Cast iron borings	6.00	to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00	to	79.00
No. 1 cupola cast	77.00	to	79.00

Seattle

No. 1 hvy. melting	$ 73.00	to	$ 75.00
No. 2 hvy. melting	62.00	to	64.00
No. 2 bundles	44.00	to	46.00
No. 1 cupola cast	98.00	to	100.00
Mixed yard cast	85.00	to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 90.00	to	$ 91.00
No. 2 hvy. melting	74.00	to	75.00
No. 2 bundles	46.00	to	48.00
Machine shop turn.	23.00	to	24.00
Crushed turnings	48.00	to	49.00
Shredder scrap	90.00	to	91.00
Cut structural plate 2 ft. and under	106.00	to	110.00
Unstripped motor blocks	62.00	to	63.00
Cupola cast	86.00	to	87.00

ORDERS RISING AT A SLOWER PACE

Durable goods orders for December indicate a slowing down of the economy, —but only slightly. The strength of the recovery appears stable.

Orders for durable goods rose to an adjusted $96.69 billion, 0.2 pct greater than November, the Commerce Department said. Within the category, nondefense capital goods orders—a bellwether of future plant and equipment spending—rose 2.4 pct in December to an adjusted $25.13 billion.

Increases in orders for electrical and non-electrical machinery industries offset declines in primary metals and transportation equipment.

Electrical machinery orders rose $1.4 billion, or 9.2 pct, to $16.0 billion, while nonelectrical machinery orders were up $600 million, or 3.6 pct, to $16.8 billion.

New orders for primary metals in December declined $1.5 billion, about 12.8 pct, to $10.3 billion. Orders for transportation equipment fell $400 million, about 1.6 pct, to $24.3 billion.

Orders for metalforming machine tools rose dramatically in December, $60 million compared with $44.9 million the previous month. Metalcutting machine tools, however, were down—$91.1 million versus $115.3 million in the earlier month.

The December figures turned out to be better than indicated by earlier advance reports that cover only durables orders. Especially encouraging was the rebound in capital goods orders not related to defense.

The annual figures for factory orders were up more than twice the rate at which prices climbed, showing substantial progress in a year of economic recovery.

The 1983 increase in factory orders was the best since the 12.1 pct gain posted in 1979. That year, however, the gain in dollars was matched by a double-digit inflation rate. Consequently, there was little change in volume during that 12-month span.

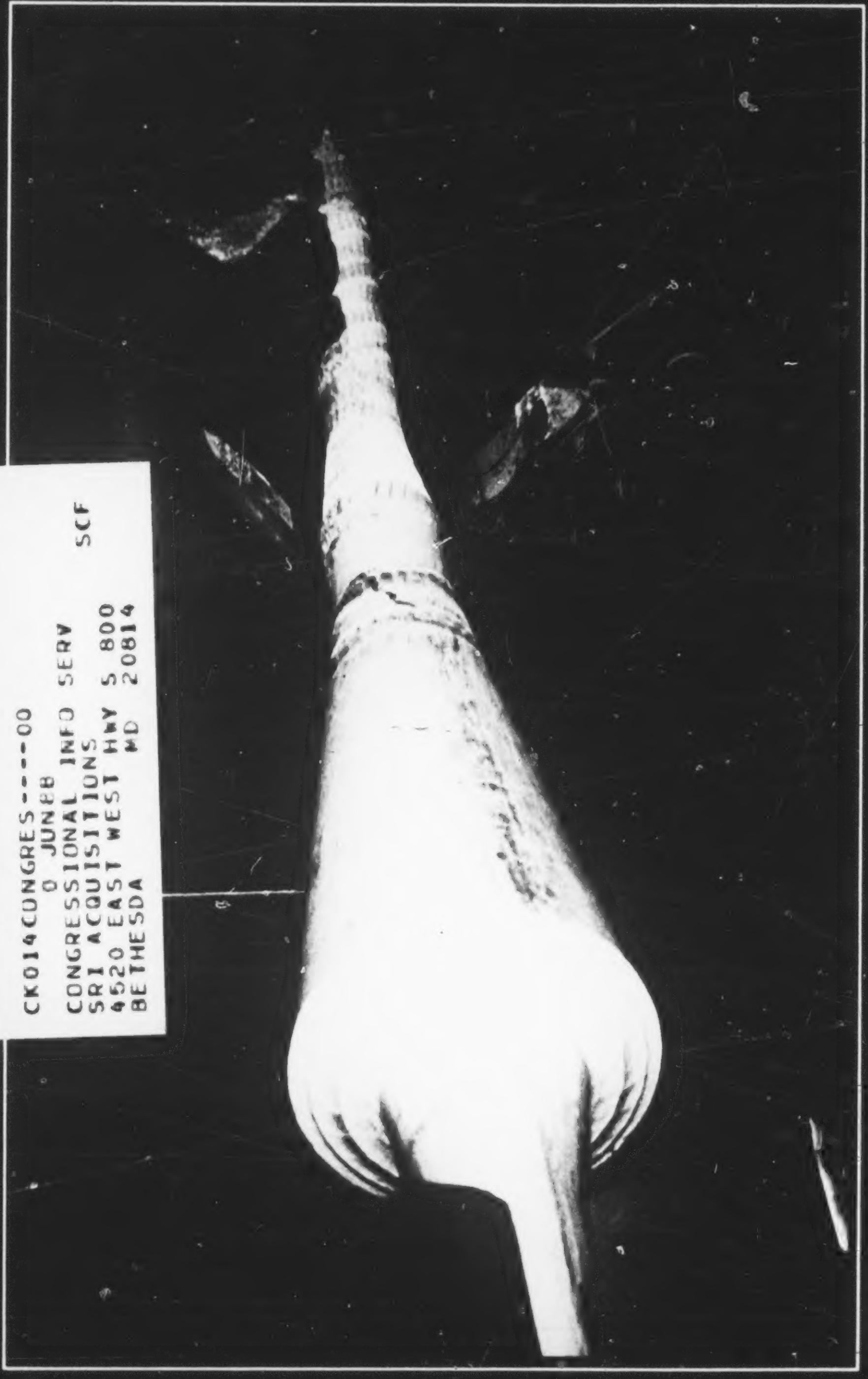
Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$321.6	$313.0	$303.1
Manufacturing, Total	4th Qtr.	114.9	117.4	110.2
Manufacturing, Durable Goods	4th Qtr.	53.5	53.0	50.5
Mining Industry	4th Qtr.	13.1	13.2	13.4
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Dec.	96.7	96.5	78.7
Shipments	Dec.	96.0	92.2	72.7
Inventories	Dec.	171.2	171.0	177.7
Unfilled Orders	Dec.	322.2	321.4	287.9
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Dec.	25.1	24.6	20.6
Capital Goods Producers, Defense Industries	Dec.	7.7	8.1	12.5
Primary Metals, Total	Dec.	10.3	11.8	6.9
Steel (SIC 331)	Dec.	3.7	4.7	2.5
Iron & Steel Castings (SIC 332)	Dec.	1.2	1.1	0.6
Nonferrous Metals	Dec.	5.4	6.0	3.7
Nonelectrical Mach.-Equip. Industries, Total	Dec.	16.8	16.2	14.1
Engines & Turbines	Dec.	1.2	1.3	0.9
Farm Machinery & Equipment (Shipments)	Dec.	1.2	1.1	1.0
Construction, Mining & Mat. Hdlg. Equip.	Dec.	2.8	2.8	1.8
General Industrial Machinery	Dec.	1.4	1.2	1.2
Fluid Power Equipment** (Index-1972≐100)	Dec.	230.0	281.0	155.0
Metalworking Machinery	Dec.	0.5	0.7	0.6
Machine Tools, Total ($ Mill., Unadjusted)***	Dec.	151.1	160.2	120.9
Machine Tools, Metalcutting***	Dec.	91.1	115.3	85.8
Machine Tools, Metalforming***	Dec.	60.0	44.9	35.1
Electrical Mach. & Equip. Industries, Total	Dec.	16.0	14.6	12.7
Elec. Transmission Equip. & Ind. Apparatus	Dec.	2.0	1.8	1.7
Household Appliances	Dec.	1.5	1.3	1.0
Communication Equipment	Dec.	5.5	4.8	4.8
Transportation Equip. Industrial, Total	Dec.	24.3	24.6	21.5
Motor Vehicles & Parts (Shipments)	Dec.	15.2	14.3	8.4
Aircraft, Missiles & Parts	Dec.	7.6	7.5	7.2
Shipbuilding & Military Tanks	Dec.	0.2	1.9	5.3
Fabricated Metal Products, Total	Dec.	10.7	10.8	8.5
Instruments, Total	Dec.	4.6	4.3	3.7

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA

CHILTON'S
March 5, 1984

IRONAGE
METALS PRODUCER

C2150-2 M



CK014CONGRES---00
0 JUNE8
CONGRESSIONAL INFO SERV SCF
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

ROTARY FORGING BURSTS ON THE SPECIALTY STEEL SCENE

LTV-REPUBLIC HOOKUP REBUFFED

IN PLANT SPOTLIGHT: HOW GRINDING IS SHAPING STEEL UP

HOT SPOT: BALDRIDGE AND RODERICK FACEOFF IN STEEL TRADE

MARCH 5, 1984 VOL. 227, NO. 5

CHILTON'S
IRON AGE
METALS PRODUCER

Cover photo courtesy of Teledyne Allvac.

Editorial
For heaven's sake, they'll go to jail!

Newswatch
Will the automakers' record profits produce record pay demands?

The Hot Spot 22
Steel trade: Are export agreements the solution?

Rotary Forging 25
New efficiencies have made its future brighter.

Steel's Inspection Methods 30
Quality is the top priority for the world's steel producers.

Metals Industries' Earnings 34
Steel takes its lumps; nonferrous is recovering.

Republic/LTV
Two steelmakers are working to salvage their proposed merger.

Financial Analysis
All eyes are on the price blips.

In-Plant Spotlight
How grinding is shaping steel up.

Materials Report
Steelmakers are revising their estimates for 1984.

Price Trends
Food and fuel increases heat up inflation.

Next Issue: Examining the Active State of Ladle Metallurgy.

Departments

EDITORIAL STAFF **8**
SIGNED, SEALED AND DELIVERED **11**
INDUSTRIAL BRIEFS **20**
PRODUCT & EQUIPMENT REVIEW **57**
FREE LITERATURE **69**
PERSONNEL TOUCH **71**
AD INDEX **74**
MANAGEMENT SERVICE CARD **75**
BUSINESS STAFF **76**
P&P DATA 2/27 **78**
FERROUS SCRAP 2/27 **79**
STEEL PRICES **80**
CLEARING HOUSE **82**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc

STEEL TAKES ITS LUMPS; NONFERROUS RECOVERING

BY GEORGE MCMANUS
AND ROBERT REGAN

Steel

In 1983, the steel industry lost close to $3 billion.

That brought the cumulative loss over two years to $6 billion.

Some of the huge deficit reflected write-offs for facilities shut down. United States Steel Corp. had a pre-tax charge of more than $1 billion for shutdowns. Republic Steel Corp. had a pre-tax write-off of $194 million.

There were other charges of this type but there were also upward adjustments from inventory changes and various one-shot credits.

The red ink displayed by steel companies was all too real. What was discouraging about the financial situation was that it held little promise of decisive improvement very soon.

Volume Rising

Steel volume is rising, but volume is only part of the problem. In the fourth quarter, steel shipments were just under 18.4 million tons. That was the best quarterly volume since 1981.

Nevertheless, the seven largest mills had a combined loss of $1.3 billion. In the fourth quarter of 1983, the steel industry earned a half billion dollars.

The swing from black ink to red ink was largely due to price erosion. With discounts as high as $100 a ton, the

fourth quarter but only compared to the substandard levels of earlier periods. As late as December, the mills were operating under 55 pct of capacity.

Business is continuing to improve. Steel shipments will go over 19 million tons in the first quarter of 1984. The recovery is broadening. Demand for oil country products has jumped in the last few weeks. Orders for plates have risen.

The added volume will help but price problems linger on. The magnitude of these problems showed up in the fourth quarter of 1983. Although overall demand was depressed, sheet mills operated at relatively high levels—80 to 90 pct.

Steel continued to take heavy losses, posting a loss of nearly $3 billion. Aluminum led nonferrous

National Intergroup, Inc., which specializes in sheet, had an operating profit of $31 million in the fourth quarter of 1983. That was certainly better than the operating loss of $17.7 million in the fourth quarter of 1982, but it certainly wasn't satisfactory.

With National's shipments up 67 pct from the 1982 quarter, the skimpy profit was very unsatisfactory. Shortly after reporting 1983 results, National revealed that it was selling its steel operations to U.S. Steel. That decision may be reversed by the Justice Dept., but National apparently believes there are greener pastures outside steel.

The point is that higher prices are needed to bring higher steel profits. As the sheet experience shows, it doesn't necessarily follow that better volume will bring better prices.

In this connection, it's worth recalling that the steel industry made no money in 1977 when more than 91 million tons were shipped. A price collapse wiped out earnings despite a good operating level.

Domestic mills blamed imports for the 1977 collapse

STEEL CONTINUES TO TAKE A POUNDING

1983 PROFIT REPORT (In Millions of Dollars)

	EARNINGS				SALES		
	1983 E/S	1983	1982	Pct Change	1983	1982	Pct Change
USS	—	$(1,161.00)	$(361.00)	—	$17,523.00	$18,907.00	−7.3%
BETHLEHEM	—	(163.50)	(1,469.60)	—	4,898.20	5,260.30	−6.9%
ARMCO	—	(672.50)	(345.10)	—	5,430.00	4,160.00	+23%
NATIONAL	—	(154.32)	(462.77)	—	2,992.70	3,044.21	−1.7%
REPUBLIC	—	(326.50)	(239.20)	—	2,700.00	2,740.00	−1.5%
INLAND	—	(116.90)	(118.80)	—	3,046.24	2,699.54	+13%
LTV	—	(180.70)	(154.90)	—	4,577.80	4,776.80	−4.2%
TOTAL	—	(2,775.42)	(3,151.37)	—	41,167.94	41,587.85	−1.0%
CYCLOPS	—	(2.19)	(11.92)	—	1,024.11	873.17	+17%
WHEEL-PGH	—	(54.08)	(78.94)	—	772.32	755.08	+2.2%
LUKENS	—	(14.01)	1.48	—	342.86	389.68	−12%
QUANEX	—	(3.51)	(34.52)	—	297.37	348.30	−15%
CF&I	—	(94.20)	(23.50)	—	231.09	362.84	−36%
EASTMET	—	(8.24)	(10.23)	—	192.16	155.52	+24%
LACLEDE	—	5.05	(8.11)	—	190.15	178.22	+6.7%
CARPENTER*	—	6.61	(0.61)	—	116.83	88.39	+32%
FLORIDA*	—	0.42	(1.52)	—	63.65	50.33	+36%
COPPERWELD	—	(22.01)	(10.13)	—	325.48	372.19	−13%

*Quarter Only

STEEL 4TH QUARTER PROFIT REPORT—1983 (In Millions of Dollars)

	EARNINGS				SALES		
	1983 E/S	1983	1982	Pct Change	1983	1982	Pct Change
USS	—	$(983.00)	$(363.00)	—	$4,707.00	$4,281.00	+10%
BETHLEHEM	—	(27.40)	(1,146.90)	—	1,322.50	1,029.30	+28%
ARMCO	—	(46.80)	(182.80)	—	1,070.00	1,110.00	[illegible]4%
NATIONAL	—	(37.95)	(281.96)	—	784.34	643.74	[illegible]22%
REPUBLIC	—	(211.00)	(60.60)	—	783.70	520.10	+51%
INLAND	—	(45.93)	(31.48)	—	867.35	599.88	+45%
LTV	—	7.50	(98.10)	—	1,511.50	907.40	+67%
TOTAL	—	(1,344.58)	(2,164.84)	—	11,046.39	9,091.42	+22%

NONFERROUS ON A COMEBACK

Millions of Dollars

	Net Income			Sales and Other Revenues		
	4th Q '83	4th Q '82	Pct Change	4th Q '83	4th Q '82	Pct Change
Alcan	$55.0	$(60.0)	—	$1,408.0	$1,086.0	+29.7
Alcoa	96.3	(33.7)	—	1,469.7	[illegible]	[illegible]
Amax	(366.9)	(244.5)	—	[illegible]	[illegible]	[illegible]
[illegible]	11.7	8.9	+31.5	[illegible]	[illegible]	[illegible]
[illegible]	7.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	2.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1.4	7.1	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	5.6	10.4	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	(54.6)	(58.3)	—	[illegible]	[illegible]	[illegible]
[illegible] Aluminum	2.1	1.2	+75.0	34.4	28.1	[illegible]
[illegible] Aluminum	42.0	(123.4)	—	861.8	772.8	+11.[illegible]
Martin Marietta Corp.	37.4	(2.4)	—	1,459.9	40.3	+23.4
Newmont Mining	1.0	17.3	−94.2	195.6	165.4	+18.3
Olin	12.2	(3.3)	—	484.9	415.4	+16.7
Phelps Dodge	(31.5)	(9.5)	—	209.4	210.0	− 0.3
Revere	12.7	(115.9)	--	146.4	118.7	+23.3
Reynolds Metals	12.3	(19.8)	—	846.6	673.1	+25.8
Vulcan Materials	18.1	8.1	+123.5	232.2	169.1	+37.3

Amax Inc.: Net loss for '83 period includes provision for losses on certain properties and investments of $[illegible] million. Net loss for '82 period includes $100 million partial writedown of an investment. Asarco Inc.: Net for '83 period includes gains totaling $[illegible] from sale of tax benefits, sale of assets in a silver operation and pension expense adjustments. Net for '82 period includes extraordinary gain of $15,7[illegible],000 from sale of an investment and stock for debt exchange, $800,000 gain from sale of tax benefits, and pretax charge of $11 million from plant closings. Brush Wellman Inc.: Results include losses from discontinued operations amounting to $[illegible] in '83 period and $[illegible] in '82 period. Cominco Ltd.: Canadian funds. Hecla Mining Co.: Net for '83 period includes $[illegible] gain from tax-loss carry-forwards. Kaiser Aluminum & Chemical Corp.: Net for '83 period includes $34.9 million gain on sale of office building and net charge of $7.6 million on write-off of certain facilities. Net loss for '82 period includes net gain of $14.3 million on sale of interest in Comalco Ltd., net charge of $15 million from settlement of litigation and net loss of $27.4 million from adjustment for disposition of certain facilities. Olin Corp.: Net for '83 period includes net charge of $9.5 million from litigation settlement. Net loss for '82 period includes $9.5 million charge. Phelps Dodge Corp.: Net loss for '83 period includes $7.5 million loss as net effect of inventory liquidation and inventory hedging program. Net loss for '82 period includes $28.8 million from sale of tax benefits. Company had an operating loss of $34.1 million in '83 period and operating profit of $13.9 million in '82 period. Reynolds Metals Co.: Net for '83 period includes $9 million charge for planned closing of facilities. Net loss for '82 period includes $21 million charge for plant closings.

"Imported steel captured over 20 pct of the U.S. market last year," said David M. Roderick, chairman of U.S. Steel.

In both 1977 and 1983, it was not just the quantity of foreign steel that hurt; it was the price. According to the American Iron & Steel Institute (AISI), the average price of imported steel fell from $538 a ton in 1982 to $374 a ton in 1983.

In this setting, domestic mills are pushing hard for government action on imports. Import quotas are being sought through legislation and through the Section 201 petition filed by Bethlehem Steel Corp. and United Steelworkers of America (USWA).

Import Opposition

The Reagan Administration has indicated stern opposition to import quotas, but political pressures will grow as the presidential election approaches.

Another form of pressure is being applied by dumping and countervailing duty suits against developing nations. The suits may present the Administration and the nations with a situation where quotas or marketing agreements are less painful than steep extra duties.

Buried under all the steel industry's problems may be a turnaround that is still very tentative but could gain momentum in 1984. One interesting development in 1983 was a new pattern at Armco Inc. Armco had an operating profit on carbon steel in the third and fourth quarters. This was offset by a [illegible] in financial services. There was [illegible] loss on oilfield equipment and [illegible]tion.

[illegible] was a switch from earlier times, [illegible] Armco's diversification was paying dividends and steel operations were a drag on earnings. However, the brighter outlook for steel did not deter Armco from shutting down its Houston, Texas, plant.

A sign that more normal times were returning came when Carpenter Technology Corp. reported a profit of $6.6 million in the fourth quarter of 1983. Carpenter has traditionally been one of the most profitable steel companies but it did lose money in the fourth quarter of 1983.

Carpenter's dollar sales were up 46 pct from the fourth of 1982. The company said prices were still depressed but it did note that a 6½ pct boost for some

stainless prices took effect in December. Tool steel prices were raised 5 pct in January.

Another encouraging note was the return to profitability of Florida Steel Corp. Florida has been a profitable, growing company, but it was hit by the general steel slump of 1982 and 1983. Operating in the highly competitive merchant bar market, the company now sees daylight ahead.

"Fabricated rebar backlogs, as well as prices, have shown upward trends," said Edward L. Flom, chairman of Florida Steel. "Merchant bar prices have been raised three times. Still this leaves merchant products $28 a ton lower than we sold these same products in 1981."

For Florida and other mini-mills, a serious problem is the escalation of scrap prices at a time when mill prices have only partially recovered.

Nonferrous

The impact of the business recovery was more apparent in fourth quarter sales of leading nonferrous metals companies than it was in the profits column, where results were obscured by special charges, extraordinary gains, tax benefits and, in some cases, narrower losses.

The impact of the business recovery also was more evident in sales and profits of the aluminum companies than it was in results of other nonferrous operations. Aluminum prices recovered smartly in 1983, in large part because aluminum is more closely tied to consumer markets, which have been the main prop under the recovery so far.

Producers of copper, nickel and molybdenum were—and still are—having a tougher time of it in the pricing arena while waiting for the recovery to spill over into capital equipment and other industrial

Copper producers also have been bedeviled by heavy inventories, particularly on the hedge markets, that have prevented price recovery despite improved consumption on the domestic market. U.S. producers also have taken foreign producers, notably Chile, to task for producing in excess of world market requirements, and international lending organizations for supporting them. Domestic producers also have renewed their campaign for import protection, but none of these moves can provide any near term benefit short of some sort of preemptive reversal of production schedules abroad. Meanwhile, a fundamentally sound statistical picture awaits a change for the better in the hedge market warehouses.

Copper Demand Up

Phelps Dodge Corp. said U.S. copper demand was "much improved" in 1983, but not by enough to counter [illegible] effect on prices of "overproduct[illegible] state-owned foreign produce[illegible] company also estimated that [illegible] per imports were up 54 pct [illegible] a record 540,000 tons. Sales of [illegible]ny-produced copper totaled 90,[illegible] tons in the fourth quarter compared with 28,600 tons in the same 1982 period when much of the company's mining capacity was shut down.

Asarco said its fourth quarter profits were adversely affected by prices for copper and silver that were below those of a weak 1982 period.

Amax reported a thin $7 million in operating earnings for the fourth quarter against an operating loss of $100.2 million in the same 1982 period. [illegible] gain in the period [illegible] mainly [illegible] in value [illegible] net loss [illegible] $244.5 [illegible] od largely [illegible] writedowns related to [illegible] lybdenum properties. These [illegible] $155 million writeoff of the Mt. Emmons molybdenum prospect and a $95 million writedown of the Cateret, N.J. copper refinery and Anamax copper properties.

Inco trimmed its operating losses to $20 million from $90 million in the final 1982 period with an assist from higher nickel deliveries at lower unit cost. The company carried 83 million lbs of nickel inventory into 1984 compared with the 106 million lbs on hand a year earlier. Falconbridge Ltd. reported a $9.7 million profit for the fourth quarter of 1983, its first quar-

(Cont. on p. 40)

If you find a wheel that costs less than Bancroft's

DISCOUNT PRICES
MULTI-PURPOSE

DON'T BUY IT!

Every manufacturer of resinoid grinding wheels has already cut prices to the bone. So you can't save money on price alone. If you find lower prices than ours — you may be losing money.

It's performance that counts!

- How consistent are the results?
- How long does a wheel last between changes?
- Does it really perform to your requirements?

Bancroft wheels are highest quality, competitive, cost effective. Ask us to prove it. We'll engineer and provide you with test wheels of the size, shape and cutting characteristics to meet your needs. Send the card or call us collect today.

Bancroft Company, Inc. *Abrasive Grinding Wheels Founded 1931*

23841 Kean Avenue, Dearborn, MI 48124
(313) 274-2100

For Information, Circle 139

TURBOLASE™

T3000

IS HERE

A compact, new-technology, multi-kilowatt, industrial laser

...that **welds** with speeds and penetrations of multi-kilowatt lasers costing over twice the price and taking up to double the floor space.

...that **cuts** with an extremely high beam quality at speeds unobtainable from any other commercially available laser.

The T3000, like our production-proven T1000, uses patented new TURBOLASE technology — a generation ahead, providing "Light Bulb" reliability at a cost per watt of **high-quality** beam power unmatched in the industry. Put the T3000 to work for you now!

Call or write for more information on the TURBOLASE T3000, the complete TURBOLASE Series, Photon's full line of Industrial CO_2 Lasers, and our 1984 series of one-day seminars on industrial laser applications in your area.

The new TURBOLASE T3000 welds 1/8-inch cold-rolled and stainless steels at 120 inches per minute, cuts 3/8-inch steel at 100 inches per minute, and 1/8-inch aluminum at 80 inches per minute.

1984 Laser Seminars:
Atlanta, Ramada Renaissance, Feb. 1
Chicago, Hyatt O'Hare, Mar. 8
Cleveland, Marriott Inn, Apr. 12

photon

LASERS...THE EDGE OF TOMORROW!

PHOTON SOURCES, INC., 12163 GLOBE RD., LIVONIA, MI 48150 / 313-591-0101

For Information, Circle 140

terly profit since the third quarter of 1981. The company had a net loss of $2.8 million for the year, compared with a $68.2 million loss in 1982. Sales figures were not released pending issuance of the annual report.

Aluminum Co. of America converted its fourth quarter 1982 loss of $33.7 million into a $96.3 million profit in the final 1983 period on a 39 pct jump in sales and an 18 pct rise in shipments to 532,411 tons. A 5 pct increase in sales over the third quarter was interpreted as a sign that earlier price hikes were starting to take hold.

Alcan in the Black

Alcan Aluminum Ltd. moved back into the black on a 40.6 pct increase in fourth quarter shipments of fabricated products and higher ingot prices, although ingot shipments were off 13 pct. The company said it expects the improving trend to continue this year because of higher ingot prices and anticipated increases in prices for fabricated products.

Reynolds Metals Co. said improvement in margins for most fabricated aluminum products lagged those for ingot in the fourth quarter last year.

Reynolds Metals' $99.1 million net loss for all of 1983 includes $61.7 million in net charges for the estimated cost of closing several uneconomic facilities. Some fabricating units were marked for closedown late last year and near-term actions could include the long-idle Corpus Christi, Texas aluminum smelter. Reynolds had fourth quarter net income of $12.3 million compared with a net loss of $19.8 million in the same 1982 period.

Kaiser Aluminum & Chemical Corp. said its aluminum operations returned to profitability in the fourth quarter. Shipments rose to 231,800 tons from 221,300 tons and prices for fabricated products were higher, the company said. Kaiser had net income of $46.2 million against a $123.4 million net loss in the final 1982 period. Liquidation of certain LIFO inventories increased fourth quarter net by $42.3 million and decreased the net loss in the same 1982 period by $11.3 million.☐

Reprints available while supply lasts. For single copy, circle No. 85 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4473

PRICE & PRODUCTION DATA

(Effective February 27, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	241	239	212	149
Buffalo	11	11	10	36
Pittsburgh	293	298	243	163
Youngstown	126	120	114	93
Cleveland	145	129	135	122
Detroit	151	152	143	137
Chicago	577	547	559	430
Cincinnati	106	99	97	80
St. Louis	85	85	83	51
Southern	221	200	194	123
Western	81	81	78	73
U.S. Production	2,037	1,961	1,868	1,457

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective February 27, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,037	1,961	14,971	10,501
Capability Utilization Rate	78.8	75.9	72.4	45.3

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.822	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 94.17	$ 95.17	$ 95.17	$ 75.17
No. 2 bundles	$ 63.17	$ 63.17	$ 60.83	$ 51.83

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$102.50	$103.50	$103.50	$ 79.50
No. 1 steel, Philadelphia	89.50	91.50	91.50	63.50
No. 1 steel, Chicago	90.50	90.50	90.50	82.50
No. 1 bundles, Detroit	98.50	101.50	101.50	75.50
Low Phos., Youngstown	100.50	104.50	97.50	69.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	79.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	111.50	111.50	111.50	112.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective February 27, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	68.00-70.00	68.50-70.00	2/24/84
Lead	24.00-28.00	25.00-28.00	1/16/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	51.00	49.00-51.00	1/10/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.25
Calcium, ton lots, crown	$3.05
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$393.50
Indium, dollars per troy oz.	$2.43-$2.65
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.91
Mercury, per 76-lb. f.o.b. N.Y.	$290-$300
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$5.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$9.67
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Feb. 20—Holiday
Feb. 21—566.82
Feb. 22—567.81
Feb. 23—567.81
Feb. 24—566.71

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64	60
Yellow brass	59	57¼
Red brass	60½	58½
Comm. bronze	61	59
Mang. bronze	61½	58
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	53
Light copper	43

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	49
Light copper	39
No. 1 composition	54
No. 1 comp. turnings	52
Hvy. yellow brass solids	35
Hvy. yellow brass turnings	30
Radiators	44

Aluminum

New mixed clips	51	—52
Old sheet	50	—51
Old cast	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	42	—43
Mixed L.C. clips	37	—38
Old sheets and cast	35	—36
Borings and turnings	26	—27
Duraluminum clippings	28	—29

Copper and Brass

No. 1 copper wire	48	—49
No. 2 copper wire	40	—41
Light copper	36	—37
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	40	—41
Cocks and faucets	28	—29
Clean heavy yellow brass	25	—26
Brass Pipe	28	—29
New soft brass clippings	41	—42

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	— 16
Old diecast zinc	10	— 11

EFFECTIVE FEB. 27, 1984

(Effective February 27, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$102.00 to	$103.00
No. 2 hvy. melting	92.00 to	93.00
No. 1 dealer bundles	122.00 to	123.00
No. 1 factory bundles (auto)	125.00 to	126.00
No. 2 bundles	59.00 to	60.00
No. 1 busheling	121.00 to	122.00
Machine shop turn.	16.00 to	17.00
Shoveling turnings	54.00 to	55.00
Cast iron borings	53.00 to	54.00
Low phos. punchings plate	125.00 to	126.00
Heavy turnings	92.00 to	93.00
No. 1 RR hvy. melting	113.00 to	114.00
Rails 2 ft. and under	122.00 to	123.00
Scrap rails, random lgth.	107.00 to	108.00
RR specialties	121.00 to	122.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	605.00 to	610.00
18-8 turnings	505.00 to	510.00

Chicago

No. 1 hvy. melting	$ 90.00 to	$ 91.00
No. 2 hvy. melting	84.00 to	85.00
No. 1 dealer bundles	115.00 to	116.00
No. 1 factory bundles (auto)	115.00 to	116.00
No. 2 dealer bundles	64.00 to	65.00
No. 1 busheling	116.00 to	117.00
Shredder scrap	107.00 to	108.00
Machine shop turn.	49.00 to	50.00
Mixed bor. and turn.	50.00 to	51.00
Shoveling turnings	60.00 to	61.00
Cast iron borings	61.00 to	62.00
Low phos. forge crop	122.00 to	123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to	133.00
Low phos. 2 ft. and under	127.00 to	128.00
No. 1 RR hvy. melting	114.00 to	115.00
Scrap rails, random lgth.	107.00 to	108.00
Reroller rails	117.00 to	118.00
Rails, 2 ft. and under	129.00 to	130.00
RR couplers and knuckles	113.00 to	114.00
RR car axles	137.00 to	138.00
No. 1 machinery cast	111.00 to	112.00
Cupola cast	105.00 to	106.00
Stove plate	106.00 to	107.00
Steel car wheels	124.00 to	125.00
Stainless		
18-8 bundles and solids	550.00 to	580.00
18-8 turnings	450.00 to	460.00
430 bundles and solids	135.00 to	140.00
430 turnings	100.00 to	105.00

Philadelphia

No. 1 hvy. melting	$ 88.00 to	$ 91.00
No. 2 hvy. melting	77.00 to	80.00
No. 1 dealer bundles	104.00 to	107.00
No. 2 dealer bundles	64.00 to	67.00
No. 1 busheling	107.00 to	110.00
Shredder scrap	98.00 to	101.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	50.00 to	53.00
Low phos. 5 ft. and under	103.00 to	106.00
Low phos. 2 ft. punchings	120.00 to	123.00
Electric furnace bundles	116.00 to	119.00
RR specialties	107.00 to	110.00
Rails, 2 ft. and under	122.00 to	125.00
Cupola cast	73.00 to	76.00
Heavy breakable cast	60.00 to	63.00
No. 1 machinery cast	99.00 to	102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to	$ 72.00
No. 2 hvy. melting	68.00 to	69.00
No. 1 dealer bundles	98.00 to	99.00
No. 2 bundles	49.00 to	50.00
No. 1 busheling	97.00 to	98.00
Drop forge flashings	70.00 to	71.00
Machine shop turn.	43.00 to	44.00
Mixed borings and turn.	28.00 to	29.00
Shoveling turnings	43.00 to	44.00
Cast iron borings	49.00 to	50.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	480.00 to	490.00
18-8 turnings	370.00 to	380.00
430 bundles and solids	130.00 to	140.00

Youngstown

No. 1 hvy. melting	$ 91.00 to	$ 94.00
No. 2 hvy. melting	73.00 to	76.00
No. 1 dealer bundles	104.00 to	107.00
No. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	14.00 to	17.00
Shoveling turnings	19.00 to	22.00
Low phos. plate	99.00 to	102.00
Electric furnace bundles	92.00 to	95.00
Galvanized bundles	90.00 to	93.00

Cleveland

No. 1 hvy. melting	$ 83.00 to	$ 86.00
No. 2 hvy. melting	50.00 to	53.00
No. 1 dealer bundles	103.00 to	106.00
No. 1 factory bundles	102.00 to	105.00
No. 2 bundles	30.00 to	33.00
No. 1 busheling	102.00 to	105.00
Machine shop turn.	13.00 to	16.00
Mixed bor. and turn.	13.00 to	16.00
Shoveling turnings	15.00 to	18.00
Cast iron borings	18.00 to	21.00
Cut structural & plates, 2 ft. and under	126.00 to	129.00
Low phos. punchings plate	126.00 to	129.00
Drop forge flashings	62.00 to	65.00
Foundry steel, 2 ft. & under	70.00 to	75.00
No. 1 RR hvy melting	87.00 to	90.00
Rails, 2 ft. and under	127.00 to	130.00
Rails, 18 in. and under	128.00 to	131.00
Steel axle turnings	67.00 to	70.00
Railroad cast	100.00 to	103.00
No. 1 machinery cast	107.00 to	110.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 80.00 to	$ 81.00
No. 2 hvy. melting	64.00 to	65.00
No. 1 busheling	92.00 to	93.00
No. 1 dealer bundles	91.00 to	92.00
No. 2 bundles	40.00 to	41.00
Machine shop turn.	15.00 to	16.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	24.00 to	25.00
Cast iron borings	27.00 to	28.00
Low phos. plate	101.00 to	102.00
Structural and plate, 2 ft. and under	105.00 to	106.00
Rails, 2 ft. and under	97.00 to	98.00
Scrap rails, random lgth.	77.00 to	78.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 87.00 to	$ 88.00
No. 2 hvy. melting	76.00 to	77.00
Foundry steel, 2 ft.	76.00 to	77.00
No. 1 dealer bundles	87.00 to	88.00
No. 2 bundles	73.00 to	74.00
Machine shop turn.	22.00 to	23.00
Shoveling turnings	29.00 to	30.00
Cast iron borings	40.00 to	41.00
No. 1 RR hvy. melting	97.00 to	98.00
Rails, random length	94.00 to	95.00
Rails, 18 in. and under	107.00 to	108.00
RR specialties	100.00 to	101.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	53.00 to	54.00
Stove plate	88.00 to	89.00
Cast iron car wheels	57.00 to	58.00
Rerolling rails	102.00 to	103.00
Unstripped motor blocks	64.00 to	65.00

Birmingham

No. 1 heavy melting	$ 80.00 to	$ 81.00
No. 2 heavy melting	74.00 to	75.00
No. 1 dealer bundles	85.00 to	86.00
No. 2 bundles	60.00 to	61.00
No. 1 busheling	85.00 to	86.00
Shredder scrap	112.00 to	113.00
Machine shop. turn.	41.00 to	42.00
Shoveling turnings	50.00 to	51.00
Cast iron borings	50.00 to	51.00
Electric furnace bundles	75.00 to	76.00
Elec. furnace, 3 ft. & under	80.00 to	81.00
Structural and plate, 2 ft.	114.00 to	115.00
Structural and plate, 4 ft.	110.00 to	111.00
No. 1 RR hvy. melting	110.00 to	111.00
Scrap rails, random lgth.	102.00 to	103.00
Rails, 18 in. and under	115.00 to	116.00
Angles and splice bars	109.00 to	110.00
No. 1 cupola cast	96.00 to	97.00
Unstripped motor blocks	80.00 to	81.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 75.00 to	$ 76.00
No. 2 hvy. melting	69.00 to	70.00
No. 1 dealer bundles	89.00 to	90.00
No. 2 bundles	44.00 to	45.00
Machine shop turn.	14.00 to	15.00
Shoveling turnings	16.00 to	17.00
Cast iron borings	30.00 to	31.00
Low phos. 18 in. and under	109.00 to	110.00
Rails, random length	88.00 to	89.00
Rails, 2 ft. and under	104.00 to	105.00
No. 1 cupola cast	77.00 to	78.00
Heavy breakable cast	40.00 to	41.00
Drop broken cast	93.00 to	94.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 49.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	44.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	500.00 to	520.00
18-8 turnings	400.00 to	420.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 72.00 to	$ 74.00
No. 2 hvy. melting	62.00 to	64.00
No. 1 dealer bundles	80.00 to	82.00
No. 2 bundles	40.00 to	42.00
No. 1 busheling	80.00 to	82.00
Shredder scrap	78.00 to	80.00
Machine shop turn.	14.00 to	16.00
Shoveling turnings	20.00 to	22.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	20.00 to	22.00

San Francisco

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 1 dealer bundles	37.00 to	39.00
No. 2 dealer bundles	19.00 to	21.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	78.00 to	80.00

Los Angeles

No. 1 hvy. melting	$ 52.00 to	$ 54.00
No. 2 hvy. melting	42.00 to	44.00
No. 1 dealer bundles	41.00 to	43.00
No. 2 dealer bundles	21.00 to	23.00
Machine shop turn.	12.00 to	14.00
Shoveling turnings	10.00 to	12.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	77.00 to	79.00

Seattle

No. 1 hvy. melting	$ 73.00 to	$ 75.00
No. 2 hvy. melting	62.00 to	64.00
No. 2 bundles	44.00 to	46.00
No. 1 cupola cast	98.00 to	100.00
Mixed yard cast	85.00 to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 90.00 to	$ 91.00
No. 2 hvy. melting	74.00 to	75.00
No. 2 bundles	46.00 to	48.00
Machine shop turn.	23.00 to	24.00
Crushed turnings	48.00 to	49.00
Shredder scrap	90.00 to	91.00
Cut structural plate 2 ft. and under	108.00 to	110.00
Unstripped motor blocks	62.00 to	63.00
Cupola cast	86.00 to	87.00

Codes identify Producers listed in the Key on page 81. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$452.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	22.45
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7, I4	23.95
U1, I3, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.85
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	26.10
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRODUCER KEY
With Principal Offices

A4 American Cladmetals Co., Carnegie, Pa.
A7 Armco Inc., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A11 Atlantic Wire Co., Branford, Conn.

B1 Baron Drawn Steel Corp., Toledo, Ohio
B3 Bethlehem Steel Corp., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Steel Co., Harvey, Ill.

C1 Calstrip Corp., Los Angeles
C6 CF&I Steel Corp., Pueblo, Colo.
C10 Copperweld Steel Co., Warren, Ohio
C11 Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Co., Birmingham, Ala.
C20 Calumet Steel Div., Chicago Heights, Ill.
C21 Cumberland Steel Co., Cumberland, Md.

D1 Detroit Strip Div., Cyclops Corp.
D2 Driver Wilber B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.

E3 Enamel Products & Plating Co., McKeesport, Pa.
E4 Elliot Bros. Steel Co., New Castle, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.
G6 Gibraltar Steel Corp., Buffalo, N. Y.
G7 Georgetown Steel Corp., Georgetown, S. C.
G8 Guterl Special Steel Corp.

H1 Hercules Drawn Steel Corp., Livonia, Mich.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Steel Corp., Chicago

J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif
K2 Keystone Consolidated Industries, Inc.
K3 Kentucky Electric Steel Co., Ashland, Kentucky
K5 Kemco Div., Foote Mineral Co., Keokuk, Iowa

L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
L5 Litho-Strip Corp., Chicago

M2 McLouth Steel Products Corp.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M8 Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M11 Midwest Steel Div., National Steel Corp., Portage, Ind.

N1 Northeast Precision Steel Co., Boston, Mass.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle, Wash.
N9 Nelsen Steel & Wire Co., Chicago, Ill.
N10 North Star Steel Co., Saint Paul, Minnesota

O2 Oregon Steel Mills, Portland, Ore.

P2 Phoenix Steel Corp., Claymont, Del.
P9 Pacific States Steel Co., Niles, Cal
P13 Penn Dixie Steel Corp., Kokomo, Ind.
P14 Pacific Tube Co., Los Angeles
P15 Philadelphia Steel and Wire Corp., Phila.

R3 Republic Steel Corp., Cleveland
R4 Ramco Steel Co., Buffalo, N. Y.
R5 Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S10 Seneca Steel Service, Buffalo, N. Y.
S16 Southern Precision Steel Co., Gulfport, Miss.

T4 Thomas Steel Strip Co., Warren, O.
T5 Timken Company, Steel Division, Canton, O.
T7 Texas Steel Co., Fort Worth, Tex.
T9 Triumph Electro Corp., Chicago, Ill.
T10 Tennessee Forging Steel Corp., Harriman, Tenn.
T11 Teledyne Columbia-Summerill, Carnegie, Pa.

U1 United States Steel Corp., Pittsburgh, Pa.

W3 Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5 Wheeling-Pittsburgh Steel Corp.
W7 Wilson Steel & Wire Co., Chicago
W10 Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14 Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	24.53	31.04	32.34	31.38	22.52	23.47	18.45	31.36	34.34	50.60	69.58	73.19
Baltimore	25.93	30.44	37.14	40.13	28.41	28.12	21.23	38.10	56.93	64.90	71.71	75.93
Birmingham	22.55	31.52	31.90	31.14	22.81	24.48	18.85	30.94	49.31	58.90	68.10	74.43
Boston	30.49	35.06	39.28	44.29	33.34	30.06	21.57	36.76	47.00	56.74	63.46	65.60
Buffalo	28.00	34.53	39.69	41.00	31.32	27.57	18.89	37.20	40.10	47.82	55.33	60.11
Chicago	27.85	33.01	36.48	30.17	23.65	23.90	17.38	31.99	36.08	40.45	45.47	51.08
Cincinnati	26.66	33.07	35.98	30.18	23.56	23.84	17.39	31.73	36.03	40.33	45.58	50.75
Cleveland	27.48	33.16	35.61	34.55	25.92	25.91	18.27	32.31	36.64	40.98	44.02	50.75
Denver	33.76	39.28	39.92	37.00	32.23	28.47	20.80	45.41	49.83	60.27	66.31	75.60
Detroit	27.48	33.83	36.92	33.00	25.61	27.17	17.46	32.00	36.14	40.44	45.84	54.26
Houston	30.96	35.65	40.32	42.92	31.09	27.99	22.40	42.44	47.15	53.76	59.26	64.61
Kansas City	28.12	32.74	37.26	46.71	25.88	28.30	18.55	34.59	42.39	47.57	53.50	65.04
Los Angeles	28.43	34.74	39.01	45.49	33.74	36.26	29.71	40.58	57.47	65.04	71.25	74.68
Memphis	24.91	31.05	33.62	33.57	25.93	26.17	20.00	34.00	36.78	49.96	59.80	69.44
Milwaukee	27.70	33.79	35.98	31.29	23.57	23.04	16.73	31.22	35.57	41.53	45.13	53.89
New York	28.52	35.30	40.00	44.75	31.81	28.14	20.54	41.14	46.00	51.91	61.12	68.72
Philadelphia	29.01	34.06	39.94	42.10	32.13	28.53	20.11	39.09	46.31	54.81	65.15	70.83
Pittsburgh	31.28	37.37	40.62	31.22	34.34	29.53	20.78	31.80	46.10	53.06	60.27	68.22
Portland	28.96	32.08	38.73	36.93	31.42	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	28.96	30.77	39.36	36.38	34.34	29.94	25.97	41.59	59.18	67.87	74.44	82.67
Seattle	24.17	34.97	34.84	34.40	22.62	27.51	25.03	40.73	54.41	71.57	75.28	81.67
Spokane	21.21	30.42	35.55	38.02	33.38	33.77	21.97	43.01	43.20	47.52	....	58.52
St. Louis	27.31	32.93	34.41	32.36	25.27	22.88	17.53	33.26	37.68	42.41	49.84	53.36
St. Paul	26.82	30.87	34.41	36.36	25.52	23.94	17.37	33.42	36.16	41.16	45.76	52.07

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2¹⁵/₁₆; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅛" round; Cold drawn—1" round; Hot-rolled 4140—1⅛" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

FOOD AND FUEL HEAT PRICES

Producer prices in January took an unexpected jump, prodded by higher tags on food and energy. Capital equipment prices rose at a moderate pace.

Prices for capital equipment rose only 0.1 pct compared with an overall jump of 0.6 pct, the Bureau of Labor Statistics (BLS) said. The overall jump was as large as the entire increase in the Producer Price Index between December 1982 and December 1983.

This followed a 0.1 pct rise in December, a 0.2 pct drop in November and small increases in most other months of 1983. The small rise in prices for finished goods other than food and energy was the same as in each of the last two months of 1983.

Without food and energy factored in, industrial price increases for January were moderate. The crude materials index, minus food and energy, dropped 3.6 pct in January. The index of intermediate products, those used in various stages of production, was up 0.2 pct.

A White House spokesman pointed out that producer prices other than foods were unchanged over the past four months. "We're confident inflation remains under control," the spokesman said, adding that the one month jump was "due to the harsh winter and its impact on food supplies."

Some economic analysts, however, believe inflation this year will be harder to control than it was in 1983.

Higher prices for trucks, office and store machinery, agricultural machinery, aircraft and chemical industry machinery more than offset decreases for machine tools, textile machinery and railroad equipment.

Prices of metalcutting machine tools were down 0.1 pct, while metalforming machines fell 0.8 pct. Prices of ball and roller bearings rose 0.7 pct. Mining and machinery parts were up 0.5 pct.

Of the 22 categories shown, 18 were up and three were down. One, automobiles, was unchanged.

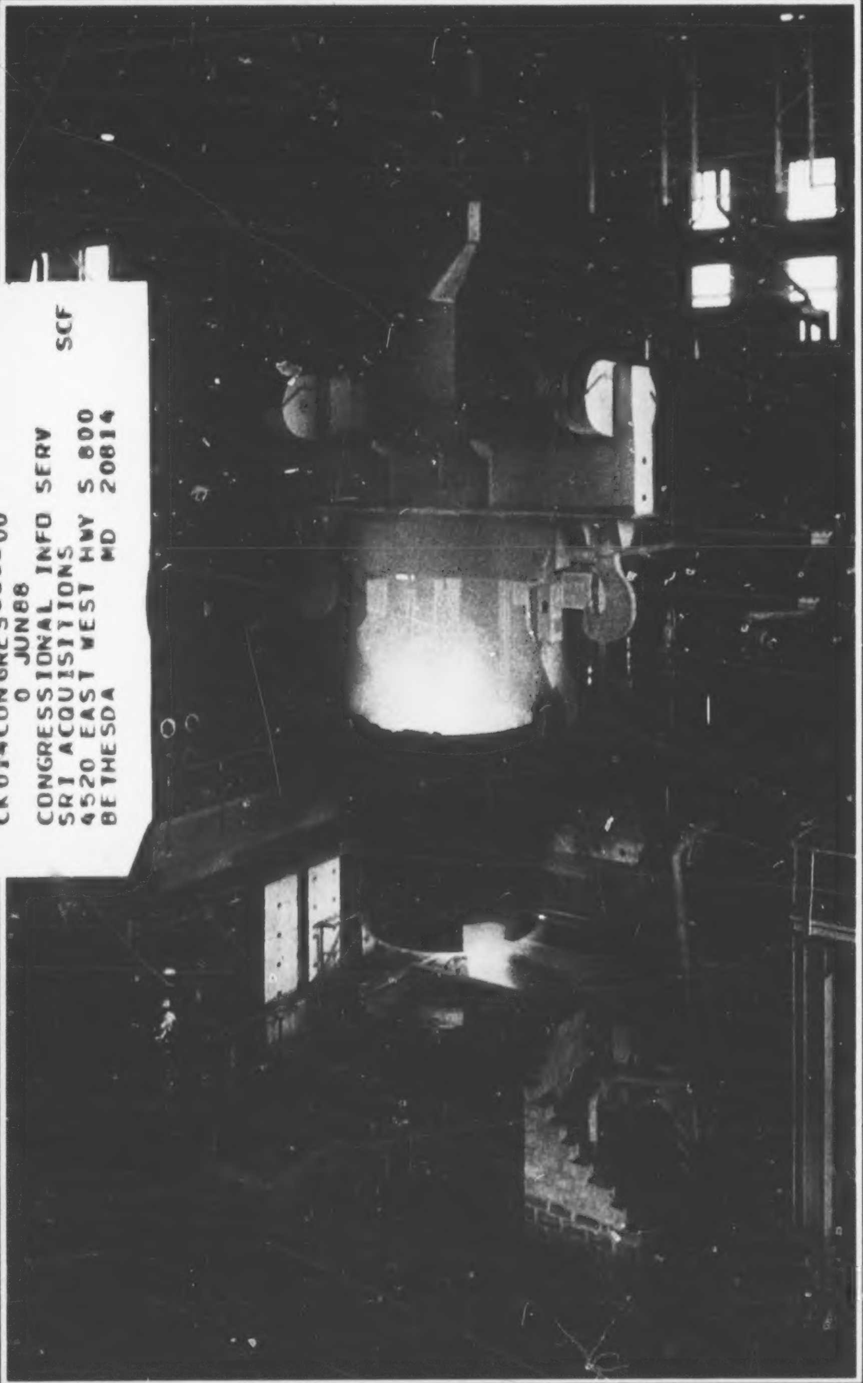
Latest Month Covered: January, 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	378.8	− 0.1	+ 1.5
Metal Forming Machine Tools	419.4	− 0.8	+ 1.6
Agricultural Machinery & Equip.	330.9	+ 0.3	+ 2.6
Construction Machinery & Equip.	354.3	+ 0.2	+ 1.7
Industrial Process Furnace & Ovens	370.2	+ 0.3	+ 3.7
Industrial Material Handling Equip.	287.0	+ 0.2	+ 0.5
Pumps, Compressors & Allied Equip.	346.1	− 0.1	− 1.1
Fluid Power Equip. (Dec. 1970 = 100)	254.9	+ 0.2	+ 2.1
Mechanical Power Transmission Equip.	321.8	+ 0.4	+ 2.8
Automobiles	221.9	0	+ 2.0
Motor Trucks—Light	280.4	+ 0.1	+ 2.5
Motor Trucks—Heavy	324.7	+ 2.2	+ 2.3
Railroad Equipment	359.2	+ 0.5	+ 2.4
Fabricated Metal Structural Products	306.5	+ 0.5	+ 1.0
Electric Motors	337.3	+ 0.4	+ 5.1
Valves & Fittings (Dec. 1982 = 100)	100.2	+ 0.1	− 0.1
Ball & Roller Bearings	335.6	+ 0.7	+ 1.4
Cutting Tools & Accessories	276.6	+ 0.3	+ 1.6
Heating Equipment	247.3	+ 0.7	+ 2.7
Plumbing Fixtures & Brass Fittings	293.9	+ 0.1	+ 4.7
Metal Containers	344.5	+ 1.9	+ 5.1
Miscellaneous Metal Products	289.9	+ 0.2	+ 3.9

Data based on U.S. Labor Dept.'s Producer Price Index

C2150-2 4/5/84

IRON AGE
METALS PRODUCER



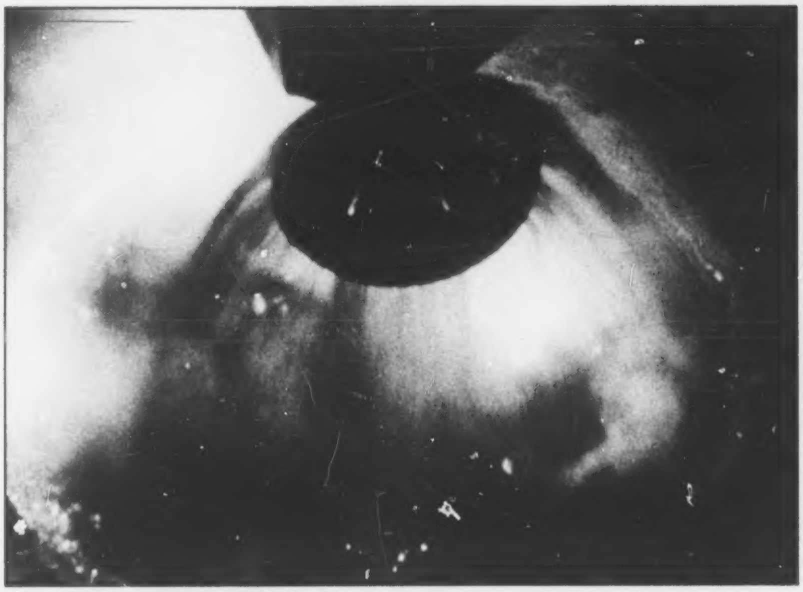
CK014CONGRES---00 SCF
0 JUN88
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

EXAMINING THE ACTIVE STATE OF LADLE METALLURGY

IRON ORE INDUSTRY UPDATE: BATTERED, BRUISED, BUT NOT BEATEN

Plus
IN PLANT SPOTLIGHT
and
THE HOT SPOT DEBATE

MARCH 19, 1984 VOL. 227, NO. 6



Cover: Photo courtesy of Inland Steel.

Editorial 7
Why not two ways?

Newswatch 19
U.S. automakers are shunning rust.

The Hot Spot 27
U.S. competitiveness: More solutions than problems?

Ladle Metallurgy 30
The technology is in a very active state.

In-Plant Spotlight 39
Two-step cooling improves CR strip.

Management Challenge 43
Managers fight back by developing motivated workers.

Iron Ore 50
The U.S. industry is battling for its markets.

Galvanizing 57
Detroit forces the issue in galvanizing.

Materials Report 79
The steel markets moved sideways in March.

You and Your Job 83
Surplus goods can turn into tidy tax deductions.

Order Trends 84
Orders keep on track in January.

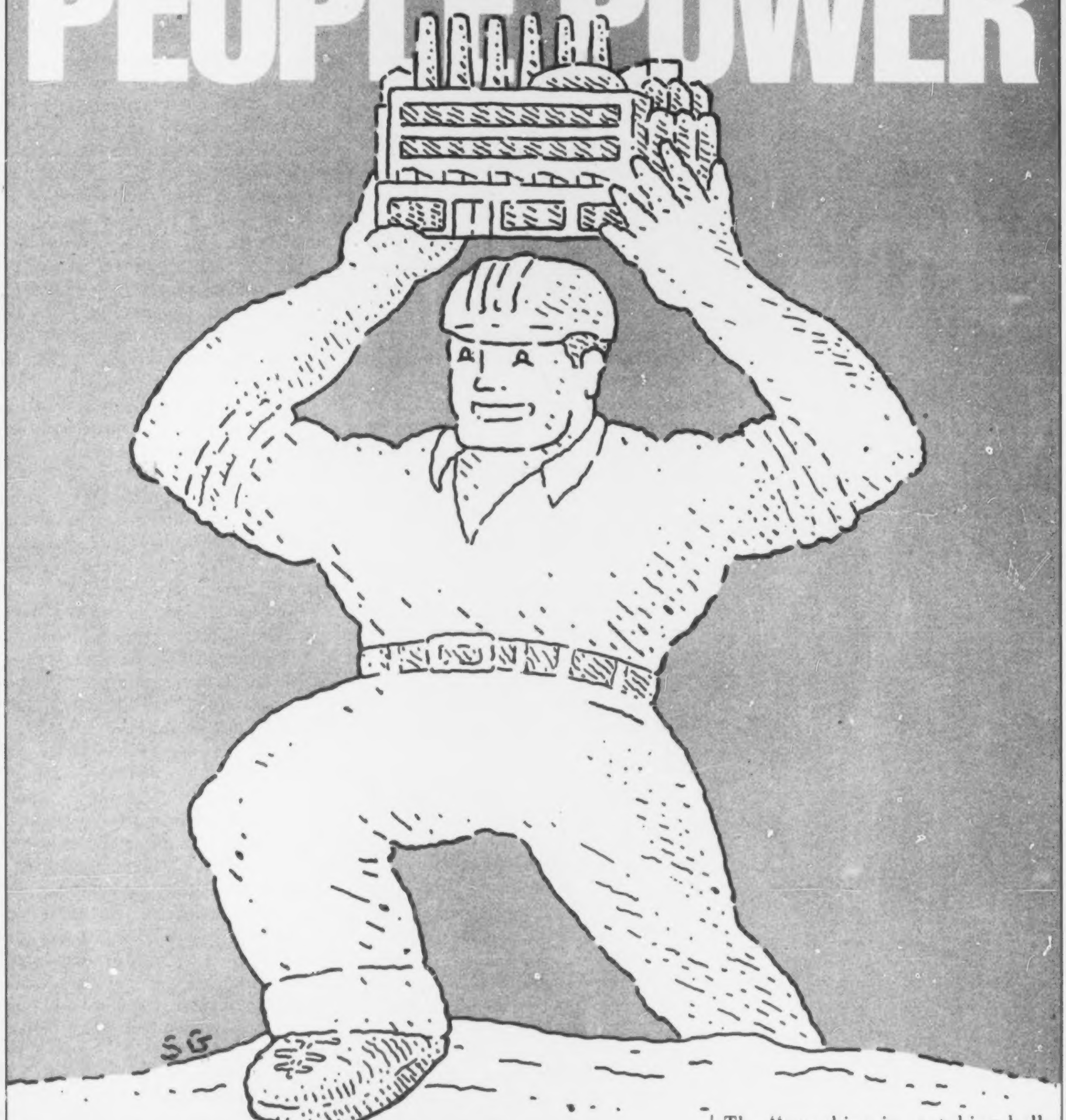
Next Issue: Casting of thin strip.

Departments

SIGNED, SEALED AND DELIVERED **8**
EDITORIAL STAFF **12**
INDUSTRIAL BRIEFS **17**
FREE LITERATURE **61**
PRODUCT & EQUIPMENT REVIEW **63**
CLEARING HOUSE **72**
MANAGEMENT SERVICE CARD **75**
BUSINESS STAFF **76**
AD INDEX **77**
P&P DATA 3/12 **81**
FERROUS SCRAP 3/12 **82**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

INDUSTRY STRENGTHENS ITSELF THROUGH PEOPLE POWER



Companies find new ways and methods to tap their mightiest resource—human capital—to become tougher world competitors

BY JOHN D. BAXTER

The "punching in, catching hell, punching out" days for workers are coming to a close in U.S. industry.

And they are coming to a close whether management likes it or not.

Actually, in an increasing number of cases, management is in the forefront of sweeping changes in the way people are being managed.

The awareness of great changes tak-

WORKER CONTROL,
TO EMPLOYEE
COMMITMENT,
IS BEING MADE IN
MANAGEABLE STEPS.

ing place in human resources management has not yet reached every executive suite in America. The move, on any sizable scale, is only about 15 years old. And it has been only in the last three years or so, that the movement has clearly gathered momentum.

What is the change all about? What forces are bringing it on?

Call it a Quality of Work Life (QWL) movement. Call it, a new era of 'participative management.' Call it, a new worker 'commitment model.' Those are terms widely used to describe the evolving workplace. There is no one label. It is a change in flux.

If there is one common element in radical workplace change, it is greater worker participation programs in the key decisions that affect and determine day-to-day work patterns.

Workers are taking on the look of 'whole people.' Instead of being viewed by management as hired hands, they are being viewed as creatures with feelings and with untapped capacities to think, to innovate and to make great improvements in the way work is done.

Some of the emerging changes in human resource management include job redesign, personalized work hours, new incentive plans, quality circles and co-management programs.

One seeming certainity is an end to the "punching in and out" environment in American industry. That earlier reference to the punching in comes from a major study of the workplace changes made by researchers at the New York Stock Exchange (NYSE). The reference goes a long way in summing up their marking of a point of change in human relations management in this country.

Not suprisingly, the clearest overview of the new human resource management movement comes from the shores of academia. And from an overview perspective, it can be said that no fad or passing fancy is seen in new industry approaches in managing human capital. The overviewers see the change as a watershed one; they see a new direction.

A New Model

Perhaps no one observer of the emerging changes in people management stands taller in the regard of many professionals in the field than Richard E. Walton of the Graduate School of Business Administration at Harvard University. He has made a clean-cut discernment between the 'old model' and the 'new model' in workforce management in this country.

"There has not been a monolithic model in the U.S. for managing workforces," he said. "But there have been central tendencies.

"The common thrust of the many elements of the traditional model has been to **impose control** in order to achieve efficiency.

"The thrust of the emerging model is to **elicit employee commitment** in order to achieve ambitious end results. The commitment model, properly implemented, is expected to produce higher productivity, better utilization of new technology and greater human development and satisfaction. It also accords more legitimacy to management."

The control model, noted Mr. Walton, was refined and institutionalized over the first half of this century. It is based on subdividing work into small tasks and holding individuals accountable for fixed job requirements.

Mr. Walton has gone on to give a clear picture of just what is covered by the new model, the commitment model.

"In the new model, jobs are defined more broadly, management is leaner and more flexible, ambitious and dynamic performance expectations replace work standards, compensation places more emphasis on learning and collaboration, employees exercise more voice, union-management relations trend toward more mutuality and employment assurance becomes a higher priority policy area."

The reasons for U.S. industry's swing to commitment-style human management is clear enough to Mr. Walton and others in the field.

"The control model," he said, "is now being replaced because of two developments.

"First, it began to break down when employee alienation often became a second order consequence of the control and efficiency measure. Increasingly, these old solutions failed, primarily because evolving employee expectations were too severely violated.

A New Urgency

A second condition hastened the obsolescence of the old workforce management model.

"The traditional model is capable of operating satisfactorily with moderately low employee commitment," said Mr. Walton. "However, the emergence of foreign competition in several industries and heightened domestic competition in others, set significantly higher standards of excellence."

That second reason noted—crunching world competition—has backed much of U.S. industry into a corner where it must fight back without delay.

It is true, there are a number of reasons why U.S. industry has been taking a beating in world trade in recent years. There are government-subsidized foreign competitors, an over-valued U.S. dollar, government trade disincentives and so on.

But from the point of view of competitive factors that U.S. companies can do anything about, there has been great relative superiority in some other countries in their motivated and committed workforces.

Very simply, American managers have not been getting the most out of their mightiest asset—human capital.

With this recognition and admission by U.S. managers, there has come the very recent drive to fight back by developing an equally motivated and committed workforce.

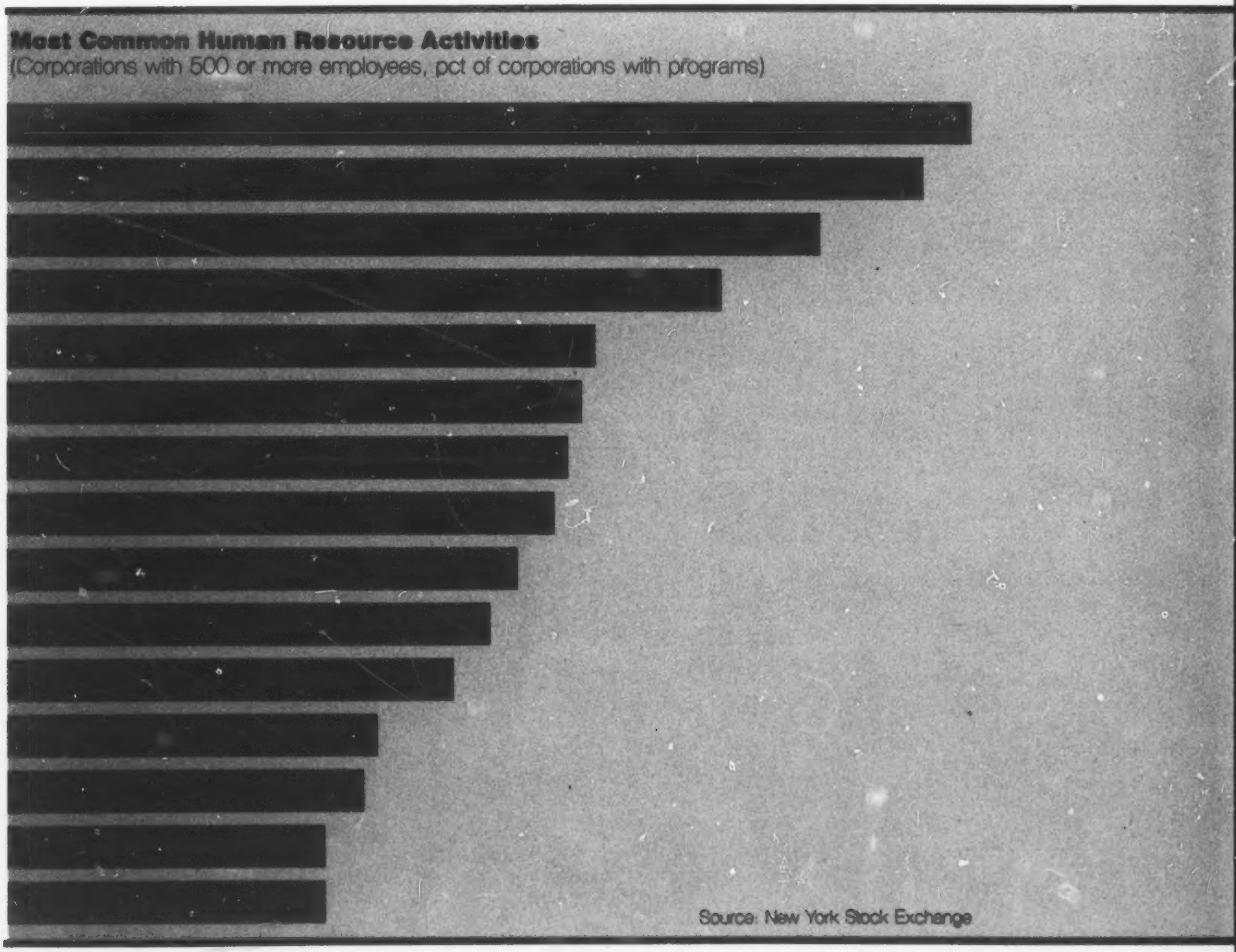
The fighting back is underway.

For example, at General Motrors' annual corporate planning conference last year, company president F. James McDonald sounded a ringing mandate to the attending top managers.

"Make QWL real, relevant and permanent in your organizations. Every manager in General Motors must get squarely behind QWL, and it must be done now. All GM executives must make this a key part of their operating plans—and insist on the same with their subordinates."

GM already has some plants operating that are widely considered to be models of the commitment type of people management.

It is true it is large corporations, like GM, that are leading the way in moving to the new 'commitment' approach in



Most Common Human Resource Activities
(Corporations with 500 or more employees, pct of corporations with programs)

Source: New York Stock Exchange

managing employees. But still, the movement has breadth to it.

Dr. Walton has said that in 1970, only a few plants in the U.S. were getting into the new type of workplace management.

"By 1975," he added, "hundreds of plants were involved. Through 1980, I estimate there were at least a thousand plants undertaking the comprehensive change limited to a few in 1970."

The Right Target

Workplace analysts warn that recent and current industry efforts to get wages and benefits pushed down are not a substitute for changes in the workplace as far as competitive strengthening is concerned. The real end of workplace changes is higher productivity.

"This matter of productivity is rarely touched on in news stories; the focus is always on wage rates and benefits," said Woodruff Imberman, a top labor relations consultant.

"This is mainly due to the fact that the dollars and cents are dramatic, productivity is not," he added. "But this is where the real story about labor costs and foreign competition comes in.

"It is higher productivity (which lowers labor cost per unit) that enables the Japanese to sell a small car or a pickup truck for $6500 when a similar American car sells for $8500. The same applies to a television set, a computer, a machine tool and so on."

Mr. Imberman is the president of Imberman & DeForest, Inc., Chicago.

While many U.S. managers are facing up to the need for radical workplace changes, many others are not. In fact, most managers apparently feel they face a deeply-entrenched negative work culture in any efforts they might make to utilize human resources as effectively as foreign competitors.

This belief shows up in an extensive survey by the pollster-consultant firm of Yankelovich, Skelly & White. This survey shows that 87 pct of business leaders believe that "negative work attitudes are an important part of the U.S. competitive weakness."

But those who have been specializing in workplace productivity analysis say that management belief is unfounded.

Satisfiers vs Motivators

There is a difference.

Extensive research by the National Science Foundation, the Public Agenda and other leading sources, shows there are steps managers can take for employees that can make those employees happier and more content on their jobs. These are known as satisfiers.

But . . . there are other steps managers can take that result in more efficient and more productive workers. These are known as motivators.

Surveys have found that 75 pct of the U.S. workforce believes that the inability of managers to motivate the workforce is the key reason why people in this country are working less than they could.

Notes consultant Daniel Yankelovich, "The lesson is clear: If managers want to capitalize on the considerable human potential that already exists in the workforce, they must focus on motivation as well as satisfiers and not confuse the one with the other."

The figures in the table represent the percentage of mentions by surveyed workers. All factors listed are mixed to some degree as to motivating or satisfying. But the predominant thrusts are made clear in the relative percentages of mentions.

Top Motivators	Employee Would Work Harder For	Makes Job More Agreeable
Good chance for advancement	48 pct	22 pct
Good pay	44	28
Pay tied to performance	42	31
Recognition for good work	41	35
Job enables me to develop abilities	40	26
Challenging job	38	30
Job allows me to think for myself	37	33
A great deal of responsibility	36	39
Interesting work	35	36
Job requires creativity	35	31
Top Satisfiers		
Good fringe benefits	27	46
Fair treatment in workload	24	46
Being informed about what goes on	20	50
Flexible work pace	19	49
Get along well with supervisor	18	52
Flexible working hours	18	49
Working with people I like	16	54
A job without much rush and stress	14	61
Convenient location	12	56
Workplace free from dirt and noise	12	55

"Our competitive position is slipping," said Charles Rourke, a management consultant in the field, "because American managers have let American workers down, not the other way around."

Mr. Rourke is president of New England's Hendrick & Co.

Too, a series of in-depth research studies by Daniel Yankelovich show that "the work ethic still thrives in this country."

Noted Mr. Yankelovich, "One does not have to search for explanations beyond the workplace for why Americans, by the millions, have chosen to hold back from making a full-hearted commitment to their jobs.

"The explanation lies squarely within the workplace itself: The cause of low commitment is faulty incentive systems and flawed management practices."

Mr. Yankelovich added that surveys show that 76 pct of workers said they "could, and would be, more effective on their jobs—if they were motivated to do so." (See copy box on Satisfiers and Motivators).

So, U.S. managers can't blame a dying work ethic for their world-competitive lag in utilizing people power. The work ethic here, surveys show, is as solidly in place as anywhere else.

Easy Entry

A company can make the move from workplace control to employee commitment approach in manageable steps.

For one thing, few changeovers from the old to the new style are company-wide in scope. Often, the transition is not even plant-wide in scope. At the outset, few employees are likely to be involved.

Mr. Walton, who has hands-on experience with commitment-type programs in companies, has noted, "The cornerstone of the transitional model is the involvement of employees in problem-solving groups. Such groups have many names including quality circles."

Actually, there are two types of group, or team, approaches used in workplace management. One is the problem-solving team as noted by Mr. Walton. The other is the work, or task, team. Participation on teams is voluntary on the part of workers.

The setting up of a problem-solving team does not affect the existing work organization in a plant. In such a team setup, employees working on a given operation are given relative autonomy in devising ways to improve that operation in just about any of its aspects.

The improvement goals of a team can be speedier production, improved product quality, cost reductions and so on. The team then 'sells' the proposed changes to management.

The work team, on the other hand, is

Announcing . . .
Immersion Pyrometers For
TEMPERATURE
MEASUREMENT
IN
MOLTEN IRON
AND
STEEL

- long term continuous temperature measurement to 3000 F
- capable of repeated immersion
- unique protective metal ceramic composite allows continuous contact with molten metals
- supplied with type R, S or B thermocouples
- custom immersion pyrometers and thermowells available

For More Information Call one of our Sales Engineers or Write

ACCUMETRIX
CORPORATION

1500 Wilson Blvd., Arlington, VA. 22209, Phone: 703-841-8895

For Information, Circle 141

comprised of workers with various skills and specialities organized to serve as an actual producing unit. In time, all members of such teams are trained to perform any and all jobs within the production unit. Too, members of the teams at any one time work at the skill or speciality that is needed to optimize production in their work area. Team members are usually paid at their highest skill rating regardless of the time they actually work at that skill level.

Work teams, unlike problem-solving teams bring change to the organization of work in a plant. They are usually not a starting point in any company's commitment to changes in the workplace. Such teams are in action throughout companies of the caliber of TRW Inc. and Hewlett-Packard.

One company that has had success with employee problem-solving teams is Jones & Laughlin Steel Corp. John H. Kirkwood, formerly vice president of Industrial Relations at J&L, said that documented cost savings of $9 million were made in a single years' time through use of such teams. At the time the savings were made, the worker participation program was in place only two years and relatively few employees were on teams.

Mr. Kirkwood, who had started the teams at the steel company, very recently left J&L to head up his own firm, Kirkwood Consulting Associates, Inc.

"There are many problems," Mr. Kirkwood told *Iron Age*, "that basic industries such as steel and autos can do little about—foreign competition, cost of energy, costs of many raw materials and so on.

"But one key area that is within their control is the effective use of their employees to improve productivity and product quality."

Mr. Kirkwood sees the employee team approach such as at J&L, and the entire new employee participation movement, as "the emerging people management strategy that companies—especially those in basic industries—have to turn to. Those that do not, will be at a competitive disadvantage in the marketplace."

In the face of all the hard reasons for, and the big payoffs, in managing people in the new ways, the movement will probably expand mostly because the philosophy of American managers is changing.

The New York Stock Exchange study, after polling the many companies as to why they set up human resources programs, summed up: "The most striking response, and perhaps the one of mosty fundamental significance, is the acknowledgment of a change in management philosophy."

The new philosophy may be more humane than the old authoritarian one. But still, it has a practical basis to it.

This idea was expressed clearly by Don M. Decker, Dana Corp. public relations director, at a recent Conference Board meeting on Work Innovations in a Restructuring Economy:

"From a cold, objective, pragmatic business approach, it doesn't make any sense to hire 'part of a person' and that is exactly what we are doing when we hire only a person's strong back. The most valuable part of an employee is his or her ability to think—to be creative—to be innovative—to question—to challenge.

"When we don't use these assets, we are doing ourselves, our company and our employees a disservice." □

Reprints available while supply lasts. For single copy, circle No. 94 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4482

Do's and Don'ts on Improving Job Performance

In-depth research shows that the work ethic still thrives within the ranks of U.S. workers. Research also shows that the main block to expression of this work ethic in terms of improved job performance is the failure of management to unleash it.

Based on the research, here are critical do's and dont's intended as a guide to management in stimulating and enhancing the work ethic.

The list and explanations that follow was compiled by consultant-pollster, Daniel Yankelovich and Prof. John Immerwahr of Villanova University.

Do tie remuneration directly to performance that enhances the efficiency and effectiveness of the company.

Do give public and tangible recognition to employees who maintain standards of quality and make an effort that exceeds average satisfactory job performance and achievement.

Do accept wholeheartedly the principle that employees should share directly and significantly in overall productivity gains (however defined).

Do encourage jobholders and the workforce to participate with management in defining recognizable goals and standards against which individual performance can be judged.

Do give special attention to the difficulties that middle managers face in supporting and enforcing programs to restructure the workplace.

Do Not permit situations to develop where the interests of employees run counter to the well-being of the company—e.g., by introducing new technology in a way that threatens employees' job security or overtime.

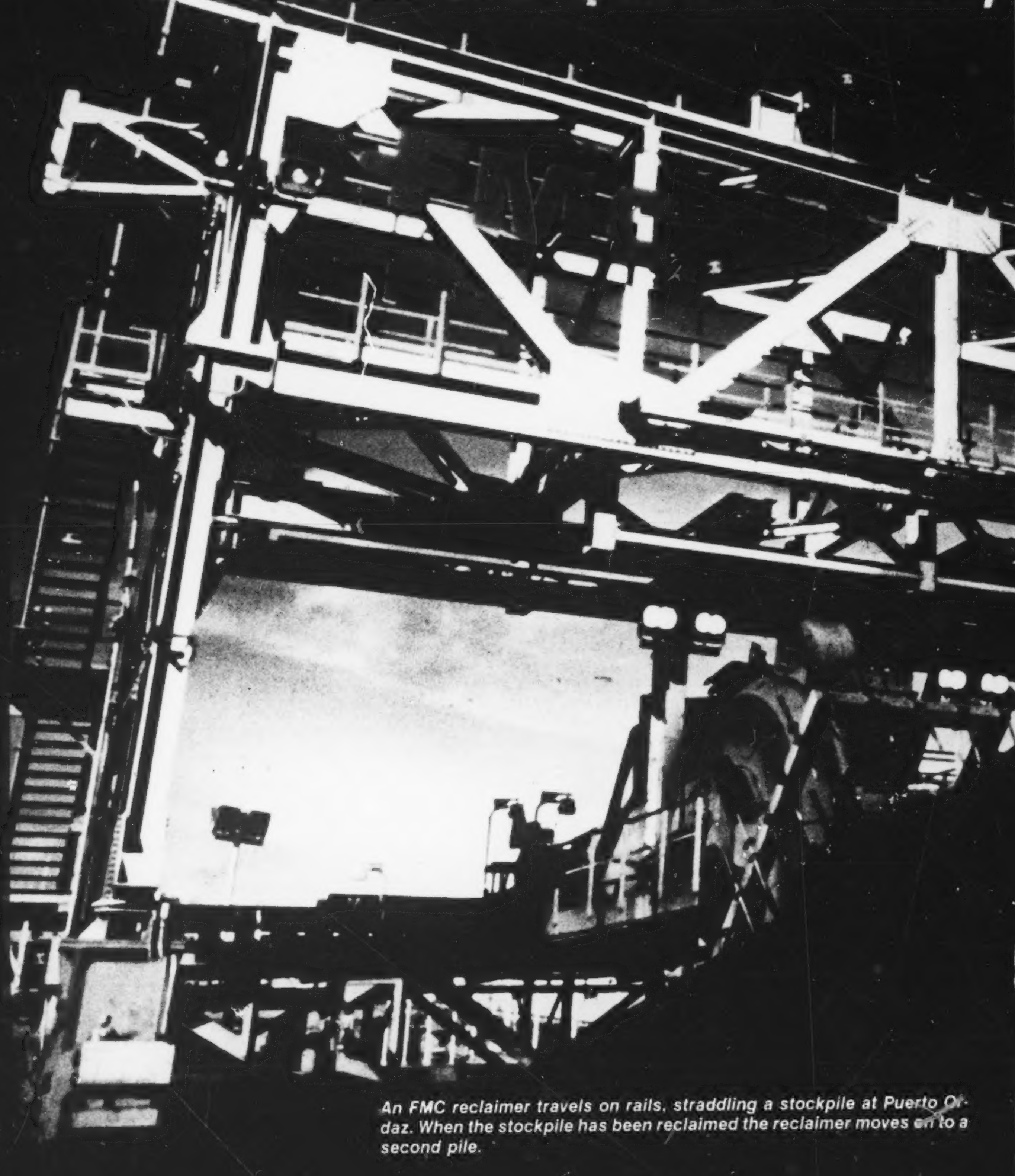
Do Not attempt to improve standards of quality unless you are prepared to accept its full costs—e.g., discarding substandard products, paying more for better components or transferring or dismissing employees who cannot perform to high quality standards.

Do Not permit a significant gap to develop between management rhetoric and the actual reward system—nothing feeds employee cynicism as much as management blindness, or insincerity about what forms of behavior really "pay off."

Do Not pretend that programs designed to increase productivity are really intended to enhance job satisfaction and the dignity of work.

Do Not support special privileges for managers that serve to enhance the status of managers by widening the gap betwen them and those who do the work—e.g. giving bonuses to managers at the same time that employees are being laid off.

IRON ORE UPDATE: BATTERED,



An FMC reclaimer travels on rails, straddling a stockpile at Puerto Ordaz. When the stockpile has been reclaimed the reclaimer moves on to a second pile.

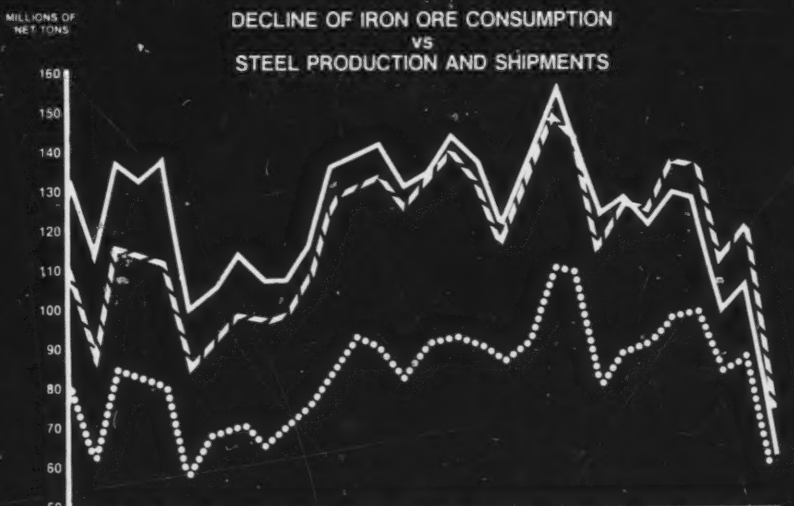
BRUISED, BUT NOT BEATEN

BY GEORGE A WEIMER

The U.S. iron ore industry is battling the foreign competition for a piece of the market at home and abroad.

Expansion and contraction are the trends in iron ore. A contradiction? Not at all. Iron ore mining is really two separate industries. One is the Great Lakes iron ore business. The other is the world which moves on the high seas between Brazil, Venezuela, and Europe, Australia, Japan and Korea. The two, however, are not insulated from each other.

For world iron ore, the trend has been expansion for many years. For the Great Lakes, the trend will continue



due to contraction in North American steel. Whether the world situation continues to be characterized by expansion depends more on politics than economics. In Carajas, Brazil, for example, some 15 million new tons of high grade ore capacity will come onstream even though there's a glut.

This is happening, "because Venezuela wants expansion, period, with or without market justification. They'll price accordingly," said one expert.

Meanwhile, the Upper Peninsula of Michigan and Minnesota are experiencing a severe contraction.

"We are in a period of contraction in basic industries. One reason, of course, is the tremendous increase, since 1973, in the price of oil," said Hanna Mining Co.'s general manager of sales Alan Polansky.

Prior to 1973, we "built a terrific expansion in basic industry with cheap oil. Now we're in a less-is-more philosophy mode. The terms today are value and quality," said Mr. Polansky.

"We are undergoing a fundamental change in our society. There's a transition going on and a different kind of economy is emerging. Basic industries will be restructured smaller," he added.

But, what if other experts are correct in predicting a steel capacity shortage in a few years? Is the U.S. iron ore industry overreacting? "I don't think so. There's a huge oversupply in terms of both steel and iron ore in the U.S. There will not be a shortage of iron ore," Mr. Polansky said.

Unfortunately, "the vast majority of iron ore producers are owned or controlled by governments," he noted.

Fortunately for American iron mining companies, foreign ore is a matter of high grade and is not suitable for American blast furnaces.

While foreign ore is very high grade, often above 66 pct iron (Michigan taconite, for example, is only 27 pct iron and must be beneficiated), the real threat to U.S. miners comes up a step in the value added hierarchy.

A report in 1978 called "Steel at the Crossroads," said the U.S. steel industry needed $7 billion annually to modernize. "They spent it wrong," said Thomas E. McGinty, president, Belvoir Consultants, Inc., Shaker Heights, Ohio. "They never modernized their finishing. They weren't market oriented. They modernized iron ore, blast furnaces, BOF's and so on, but not finishing. As a result, steel is buying slabs or hot-rolled bands. That's a real trend."

That "real trend" towards imported semifinished steel is a major threat to steel's two biggest suppliers, scrap and iron ore.

The basic problem, according to Mr. McGinty, is iron ore people must now solve, is not foreign ore or foreign slabs. "The whole problem starts with the steel wage increase of 1971. Costs have simply gone up faster than prices would allow."

"We must get our costs down," said Frank S. Forsythe, executive vice president, Cleveland-Cliffs Iron Co.

But, a further problem, as alluded to by Mr. Polansky, is the nature of the rest of the iron and steel business outside the U.S. "Brazilian iron ore is not, presently, an imminent threat. But, I know they're calling on all major steel companies here and in Canada. It's going to be dumped, in my opinion," said Mr. Forsythe.

Government Sponsorship

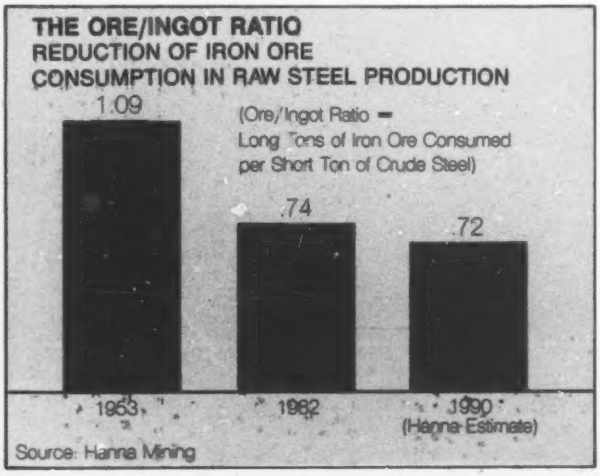
Various, huge government sponsored projects all over the world, but particularly in Brazil, Venezuela, Australia, and India, are expanding far faster than Great Lakes based mines are contracting.

One of the world's great iron ore stockpiling and shiploading facilities is at Puerto Ordaz, Venezuela. In 30 years this port is said to have handled some 400 million tons of ore. It can ship out, by water and rail, 24 million tons a year.

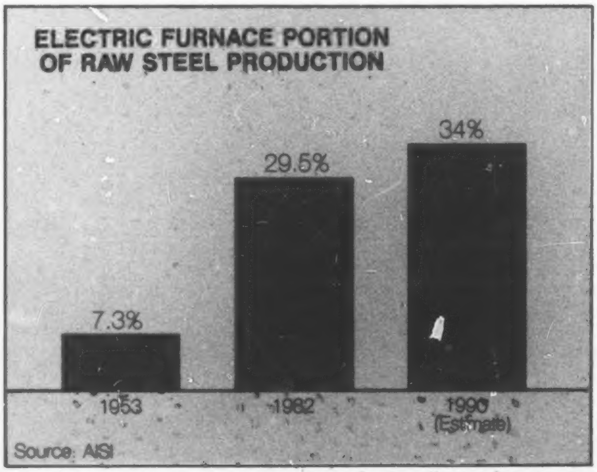
The port facility began operations in 1954, bringing the world high purity iron ore from a newly-found "mountain" of ore in an area of Venezuela.

The system now has 148 conveyors. It can store more than 3 million tons of ore on the ground at one time. It can load a 65-car train in 24 minutes or pour 80,000 tons of ore into a ship's hold in 12 hours.

But the foreign project most discussed is in Northern Brazil and is called Carajas. This project sits on top of what is probably the largest single deposit of high grade ore in the world. Reserves in the Serra dos Carajas range are estimated to be in the area of 1.8 billion tons of ore with average iron


THE ORE/INGOT RATIO
REDUCTION OF IRON ORE CONSUMPTION IN RAW STEEL PRODUCTION

Source: Hanna Mining


ELECTRIC FURNACE PORTION OF RAW STEEL PRODUCTION

Source: AISI

content of 66 pct.

The project is part of Brazil's long-range plans to develop the Amazon basin and is run by the Cia Vale do Rio Doce (CVRD), the state run mining corporation. It is important to note that Brazil, now in debt to the amount of $80 billion, receives the largest part of its foreign exchange from iron ore. As Mr. Polansky puts it, "all of the Third World countries are trying to get rich and they will continue to produce even during recessions."

Carajas will be producing in 1985.

Brazil's total reserves are in the neighborhood of 85 billion metric tons and have earned the country $1 billion or more annually for decades. Obviously, that country will remain one of the giants in iron ore for decades to come.

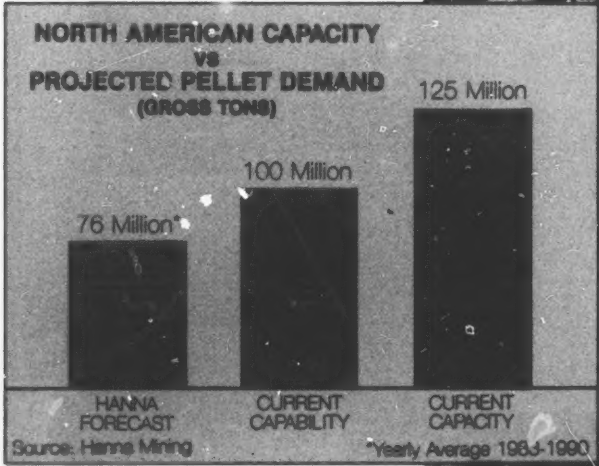
Australia is also blessed with huge deposits of iron ore, much of it contracted to Japan.

"Although business in the United States is now showing some improvement with mines reopening and the workforce being called back, the doom sayers have not been quieted. There are many still sounding the death knell of the industry," said Robert McInnes, president and chief executive officer, Picklands Mather, to the Minnesota section of American Institute of Mining Engineers (AIME).

Different Shape

"The iron ore industry has over-

Iron ore at Puerto Ordaz is brought in from Cerro Bolivar in unit trains and then unloaded by a rotary railroad car.



Source: Hanna Mining

*Yearly Average 1983-1990

come adversity many times in the past. It can and will do so again in the future. However, its shape and structure will be different than in the past or is now.

"Today, pellets represent about 97 pct of total shipments from the Lake Superior region; a complete turnabout in 30 years. The industry's propensity to adapt to change should not be lost on our competition or our customers. We are more forward thinking and much more technologically directed than most casual observers might realize.

"The Lake Superior iron ore industry is modern with much of it built or renewed during the past 15-20 years," Mr. McInnes said.

In the late 1960's and the early 1970's, a feeling of optimism widely prevailed. Few questioned forecasts that steel would experience substantial growth in the decades ahead.

"Forecasts of 5 pct per annum growth were common. The tenor of the times and outlook of the mills was decidedly bullish, and it was wonderously clear that more pellet capacity would be required.

"So, in the period 1965 until today, a vast expansion in capacity of Lake Superior pellet plants took place. Eight new operations were begun. Expansions were put in place before their initial construction was completed. The increased tonnages were dramatic. In 1965, pellet capacity was 27 million tons. By 1983, capacity had grown to 86.3 million tons," said Mr. McInnes.

The only problem was that anticipated growth did not occur. "In fact, today the steel industry is in a state of contraction. The reasons are many. They include subsidized steel imports, aging steelmaking facilities, substitute materials, excessive labor costs, and a mature economy.

"And while these problems are affecting our biggest customer, the iron ore industry is being impacted by many other conditions. Installation of continuous casting, low cost subsidized imports and growth of electric furnace use are just some," Mr. McInnes said.

He is pleased with, and strongly supports, the steel industry in its rapid move into continuous casting, but the simple fact is that the process results in 10-15 pct less iron ore usage. "That's because strand casting increases the yield of finished product from a specific quantity of raw steel.

"Importation of subsidized or low cost foreign iron ore is, without question, one of the threats our industry faces both now and in the future. How we meet that threat could well determine our survival," he said.

In 1983, the U.S. steel industry had a capability to produce 149 million tons of steel, of which 92 million tons was blast furnace/BOF origin. It actually produced in 1983 just over 83 million tons of steel, of which 52 million was blast furnace origin.

Next Five Years

"Over the next five years, we anticipate the steel industry capability will be reduced to 125 million tons of raw steel, of which 73 million tons will be blast furnace/BOF origin."

Pickands Mather estimates that at today's steel industry operating levels, there is approximately 40 million tons of excess pellet capacity. "I don't have to tell you the implications of that overhang coupled with a smaller steel industry and new off-shore iron ore capacity coming on line," said Mr. McInnes.

While iron ore management must assume much of the responsibility for cost control, "which, frankly, means cost reduction," there are also a number of outside influences.

"Take, for example rail freight costs. In Minnesota, we are looking at a cost of over $5.00 per ton of pellets. In Michigan, the comparable numbers are only about $2.50."

Iron ore mining and processing in the Lake Superior district is energy intensive.

Energy costs since 1972 have risen about 244 pct and, for most operations, are one of the largest single cost components to produce a ton of pellets.

"Our challenge in the next several years will be to continue to develop alternate, less expensive forms of energy and make some further breakthrough in reducing our energy needs.

"Our labor costs are high, perhaps the highest in the world. There were times when we could be proud of that fact, but the point is that these labor costs are a part of the problem now making us non-competitive. Management, with union cooperation, is addressing that problem in every possible way through job combinations, more effective scheduling and other actions."

Another industry leader, Robert F. Anderson, chairman and president, Hanna Mining Company said, "The shrinking steel industry hasn't been the only problem facing domestic iron ore producers. Technological changes also have eroded the market for iron ore."

The ore-to-ingot ratio has fallen some 30 pct in the past three decades.

The growing use of electric furnaces, which use scrap metal instead of iron ore, "also has eroded our market," Mr. Anderson said.

But one of the greatest problems we face is imports on several levels. "First, we are facing a tremendous flood of imported finished goods that contain foreign steel. Foreign cars, for example, captured a record 28 pct of the domestic market in 1982 and "probably would have increased that share last year but for the voluntary restraints accepted by the Japanese," noted Mr. Anderson.

Second, "we face a virtual tidal wave of imported steel, which captured over 20 pct. of the domestic market in 1982 and 1983.

"Finally, domestic iron ore producers face a direct import threat from overseas producers who have significantly lower production costs and higher quality ore deposits."

Unfortunately, "we don't foresee much improvement for the domestic steel or iron ore industries. Presently, we're expecting North American steel mill shipments to average only about 95 million tons a year through the end of the decade. And that includes Canadian shipments."

Based on this projection, "we have calculated that iron ore pellet demand will average only 76 million tons a year through 1990. And that's assuming we won't see substantially increased imports of either semi-finished steel or iron ore," he predicted. □

Reprints available while supply lasts. For single copy, circle No. 82 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4490

DETROIT FORCES THE ISSUE IN GALVANIZING

Auto demand pushes steel producers into new projects. National Steel to invest $70 million in a new electrolytic line.

BY GEORGE J. MCMANUS

In December 1983, General Motors Corp. summoned producers of galvanized sheet to Detroit.

"They've asked everybody to give them a one-hour presentation," said James V. Sprong, director, new product technology, Jones & Laughlin Steel Corp.

Speaking in November, Mr. Sprong explained that this would be on, "what do you think will be required for the automotive industry for 1987 models and beyond? What kind of equipment do you need? Do you have it? When are you going to have it? What is going to be the capacity?"

For 1987 models, which will start rolling off lines in 1986, General Motors and the other auto companies are thinking in terms of extensive guarantees against corrosion. As a means of providing corrosion protection, the automobile companies want a coated sheet that is paintable, weldable and formable.

The best answer to these requirements seems to be electrolytic coating with zinc or some combination of protective agents. Most of the galvanizing capacity in the U.S. is of the hot-dipped variety.

All of which helps to explain the rush of sheet producers into electrolytic galvanizing. The latest move came February 27 when National Steel Corp. announced a $90 million program that will include a $70 million electrolytic line at Great Lakes Steel. The new galvanizing line will be able to produce 400,000 tons a year.

Shortly before this—on February 20—Bethlehem Steel Corp. revealed plans for converting a tinning line at Burns Harbor to electrogalvanizing.

On February 7, Wheeling-Pittsburgh Steel Corp. and Nisshin Steel Co., Ltd., of Japan announced that they were joining in a $40 million venture for coated steels.

On January 18, Bethlehem and Inland Steel announced that they were joining in a development program for electrogalvanizing sheet.

In short, steel companies aren't allowing much grass to grow under their feet. On December 15, National said it was installing prototype electrolytic lines at Midwest Steel. A little over two months later, National was going ahead with a full scale commercial installation.

In explaining why all the hurry, National indicated the auto push for corrosion protection will call for a lot more galvanizing capacity. The auto requirement was seen going from 1.5 million tons a year to 3 million tons by 1987.

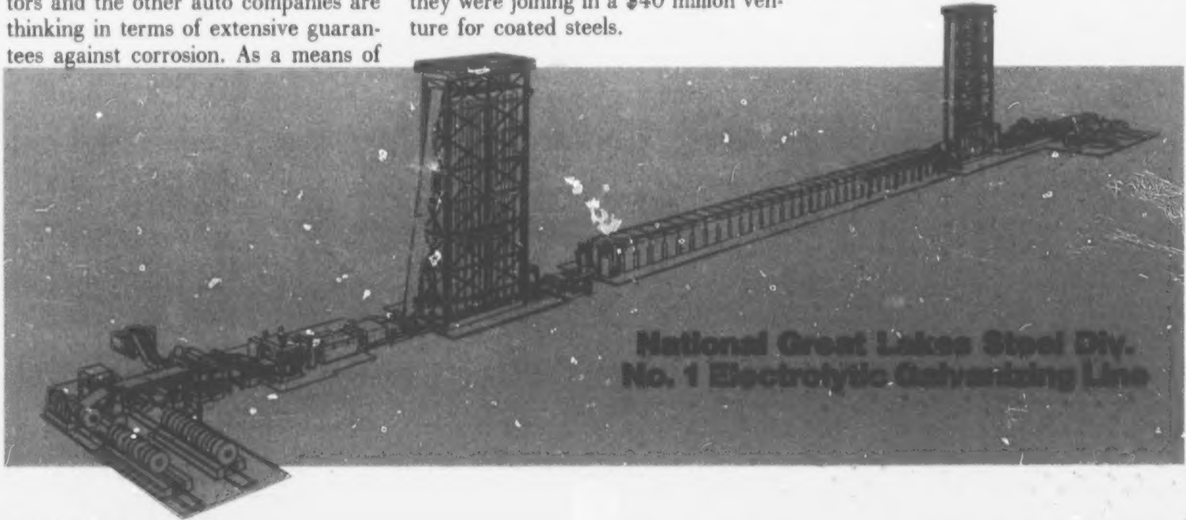
Breakthrough

"We are on the threshold of a materials use breakthrough in the automotive industry," said J.D. Turner, vice president for marketing and sales at National.

With regard to the kind of capacity needed, National noted that the auto companies were shooting for 10 years protection against perforation corrosion and five years protection against surface corrosion.

"We believe the galvanized steel that will be produced on our new electrolytic line will help our customers meet those goals in the most cost-effective way," said Robert D. McBride, president of National Steel.

For long-term corrosion resistance, the auto people want a sheet with a protective coating on both sides. That means the coating on the outer surface



National Great Lakes Steel Div.
No. 1 Electrolytic Galvanizing Line

must be smooth enough to provide a good base for painting. The electrolytic process gives the desired surface.

"This process will produce coated steels with surface qualities (smoothness and paintability) equal to the current Class I Critical Exposed automotive cold rolled steel, which is the industry standard," said James Howell, engineering vice president for National.

The auto people want good forming properties. Many of the hot dip galvanizing lines now in use have continuous annealing as part of the coating process. The continuous heat treatment produces a relatively stiff sheet. There are ways of imparting ductility but they add to cost.

In the electrolytic process, there is no heat treating. The steel retains the forming properties imparted by earlier annealing.

"The formability of the coated steel will be at least equivalent to the best steels now available," said Mr. Howell.

A final requirement of the auto industry is weldability. The electrolytic process can minimize welding problems by applying a thin coat of zinc. National's line will have a high degree of flexibility. It will be able to apply different coating weights on the two sides of a sheet. It can leave one side bare.

The line will be able to apply alloy coatings. It will be possible to apply layers of different coatings. Maximum width will be 72 in. Startup is expected to be in December 1985.

Bethlehem will go up to 48 in. on the tinning line being converted at Burns Harbor. The conversion is due to be completed by the first quarter of 1985.

"The conversion of the line will allow Bethlehem the opportunity to begin responding to automotive's stated needs

Body and Chassis Components Corrosion Protection

Source: National Steel Corp

Net Shipments of Hot-Dipped Galvanized Sheet

Millions of Net Tons

Year	Tons
1983	5,793
1982	4,878
1981	5,375
1980	4,787
1979	5,810
1978	5,889
1977	5,293
1976	4,914
1975	3,537
1974	5,772
1973	6,515
1972	5,196

Shipments of Galvanized Sheet & Strip to Automotive Industry

Millions of Net Tons

Year	Net Tons
1982	1,250,531
1981	1,239,015
1980	1,028,257
1979	1,400,550
1978	1,524,993
1977	1,294,210
1976	991,150
1975	656,769
1974	852,136
1973	1,075,056
1972	900,112

Source: AISI

on a prompt basis," said James G. Van Vliet, general manager of marketing. Both one-side and two-side coatings will be provided, said Mr. Van Vliet.

The joint development project of Bethlehem and Inland reflects the fact that both companies are operating continuous heat treating lines. These are separate facilities, distinct from the continuous annealing systems that are part of many galvanizing lines.

The continuous heat treating lines were installed primarily for high strength sheet. Electrolytic coating ties in nicely with the high strength sheet because it is a cold process and has no effect on mechanical properties.

Delayed Programs

Uncertainty about the kind of coating to be used is causing some mills to delay electrolytic programs. In Japan, Nippon Kokan is using its NKK-EGL process to apply zinc, zinc-iron, and iron nickel coatings. NKK began supplying sheet with the zinc-iron coating to Toyota Motor Co. in September of last year.

Nippon Steel Corp. said its LCC-H process was capable of producing zinc and zinc alloy coatings on one side or both sides. This process is of interest because Nippon Steel is a large stockholder in Nisshin Steel, which is joining in the Wheeling-Pittsburgh coating project.

The electrolytic process is flexible, but according to one engineer, the design is influenced by the type of coating preferred by the customer. If zinc iron is favored over pure zinc, it will make a difference, he said.

One-side coating is still very much in the picture, although auto usage probably won't be as great as was once expected. United States Steel Corp. is using its carrousel electrolytic process for coating one side. Armco has developed its meniscus process.

Kawasaki Steel Corp. has developed a one-side hot dipped method which employs a glassy inhibitor on one surface. Made of liquid glass and magnesium oxide, the inhibitor is washed off after coating.

At the 1983 AISE meeting, a one-side coating technique was described by officials of Mannesmann Demag and Hoesch. This employs roll coating under an inert atmosphere. A spangle-free coating is obtained through the use of zinc with a very low lead content.

It was of some interest that National Steel turned loose a $90 million program with the acquisition by U.S. Steel still pending. The selection of Great Lakes as the site for the electrolytic line was logical enough. Great Lakes is next door to the auto companies.

In the past, however, National has done all its galvanizing at Midwest Steel (except for Weirton). The prototype work is being done at Weirton. Whether this has any bearing on the proposed acquisition remains to be seen. ☐

Reprints available while supply lasts. For single copy, circle No. 96 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4484

SURFACE INSPECTION LIGHTING SYSTEM

Early Inspection Cuts Processing Cost;
Minimizes Product Downgrading

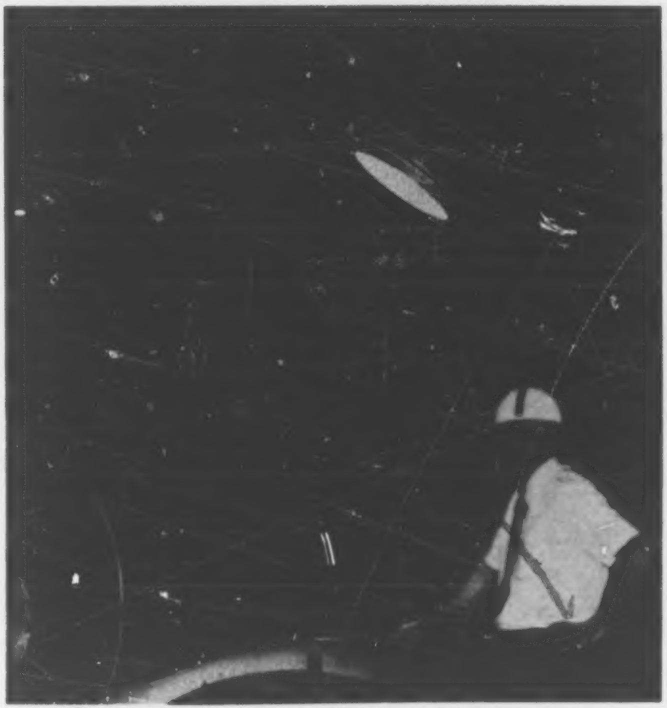
Install Unilux Inspection Lights on your slitter, temper mill, tin line, leveler—and improve productivity. With Unilux lighting, your operators and inspectors will see even very small defects at speeds up to 5000 ft./min.

SEE: Bruises, dimples, edge cracks, laminations, rust, seams, slivers, cracks, pinchers—without blur, while the material moves rapidly.

Over 250 Unilux systems inspect material at rolling, stamping and processing plants throughout the world.

Call for details on a trial installation:
Purchase, Rent or Lease

Unilux® Inc.
290 Lodi St., Hackensack, New Jersey 07601
201-489-0800 TWX 710-990-5029



Jones & Laughlin's Q.C. Supervisor
H.A. "Hap" Pendelton and the Unilux 700 Inspection system.

For Information, Circle 159

crease selected by Aluminum Co. of America (Alcoa) and matched by Alcan Aluminum Corp.

The only "tier" remaining is the one on which Japanese canstock suppliers price their offerings on the U.S. market. These were expected to be discounted from the higher level established by the U.S. companies.

Can industry sources said the initial reaction to the first Reynolds move was astonishment, particularly in view of the steady disappearance of discounts after the price hike round last August. They said the smaller hike, worth about $150 million, was easier to swallow and the 12-month price guarantees can help it go down.

Aluminum industry analyst John E. Keefe of Drexel Burnham Lambert said the smaller can stock price hikes, which take effect with shipments beginning April 1, "reflects more the coming head-to-head confrontation of Alcoa and Alcan in the RCS (rigid container sheet) market" than the generally cited factors of competitive factors like switches back to tinplate and inroads of plastics. Mr. Keefe said the price moves also reflected Alcoa's determination to demonstrate its leadership.

What happens after the Arco Aluminum rolling mill in Logan County, Ky., wins certification from the canmakers is anybody's guess. The mill, which is a central part of the package that Alcan is seeking to acquire from Arco, has initial capacity of 400 million lbs a year. If even only half that capacity is aimed at the can stock market this year, it bulks large against recent aluminum industry forecasts of canstock shipment increases in 1984.

Coal producers foresee slow, but steady growth

Steady growth is expected in all major coal markets between now and 1995 by the National Coal Association (NCA), but not at the levels previously predicted."

"Under our 'moderate growth case,' total coal consumption grows at an average annual rate of 2.6 pct," said B.R. Brown, chairman of NCA's economic committee and CEO of Consolidation Coal Co.

By the end of 1995 total consumption—domestic use plus exports—could be as high as 1.128 billion tons per year, NCA said. By the end of 1985, the NCA is predicting consumption ranging from as low as 840 million tons to a high of 889 tons.

Coal Consumption in 1985

In Millions of Tons

	Stagnation	Moderate Growth	Revitalization
Utilities	633	633	642
Metallurgical	48	48	50
Ind./Retail	76	79	81
Synfuels	—	3	5
Total	757	765	778
U.S. Production	836	852	887

Source: NCA

The association paints three "scenarios"—stagnation, moderate growth and revitalization. Consumption figures vary under each theme.

The outlook, said Mr. Brown, "is based on lower expectations for economic and energy growth, a restructuring of America's heavy, energy-intensive industries, a growing prominence in the economy of less electricity-intensive high technology industries, greater interfuel competition and demographic changes."

Under the NCA's "moderate growth" scenario, total domestic coal consumption will be 765 million tons in 1985, an 8 pct increase compared with 1982. By 1995, under moderate growth, consumption climbs to 995 million tons, 31 pct greater than 1985.

As NCA sees it, electric utilities will continue to be coal's primary market, accounting for 633 million tons in 1985 and 811 million tons 10 years thereafter, all this in the "moderate growth" picture. By comparison, utilities used 593 million tons in 1982.

The projections see only slight increases in the metallurgical coal market. Consumption of metallurgical coal for steel production is projected to grow to only 48 million tons in 1985, only 7 million tons more than in 1982, and to 51 million tons in 1995. "Slow growth in steel demand, technological improvements and limited coking capacity hold metallurgical coal growth to a lower level than previously forecast," Mr. Brown said.

Sluggish world coal demand and expanded coal export capacity by foreign competitors will limit short-term U.S. export prospects, NCA said.

But the long-term outlook remains promising.

Inco won't boost output to meet increased nickel demand

Inco Ltd. expects a 100 million lb increase in free world nickel demand this year, but the big nickel producer isn't rushing out to meet it with any burst in production.

The company carried a low 83-million-lb inventory into 1984—down 22 pct from a year earlier and the smallest stock in nearly 10 years—but it is sticking to its conservative production schedules.

Earlier this month, Inco scheduled another four-week production shutdown at its Port Colborne, Ont., refinery, beginning June 4. The move, which the company said will be made to balance in-process material flow and will have no visible effect on production, carries right into the previously-scheduled four-week vacation shutdown in July.

Charles F. Baird, chairman, said in the annual report to stockholders that the company expects a 10 pct increase in nickel demand this year. Nickel demand last year was up 125 million lbs to 1.1 billion lbs, the first increase since 1979.

Mr. Baird said price recovery is of more importance to Inco than improved demand. He said the company would have had a net profit last year instead of $234.9 million loss "if prices for Inco products had been at their 1980 levels."

On the other hand, the Inco chairman said because of the increasing impact of cost reduction programs, "we are in a position to return to profitability in 1984 at prices below those for 1980." Nickel prices were at record levels in 1980.

PRICE & PRODUCTION DATA

(Effective March 12, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	232	241	239	189
Buffalo	11	11	11	34
Pittsburgh	294	295	298	200
Youngstown	122	124	120	97
Cleveland	129	128	129	119
Detroit	162	164	152	144
Chicago	580	555	547	437
Cincinnati	105	105	99	89
St. Louis	82	77	85	50
Southern	232	224	200	134
Western	83	82	81	73
U.S. Production	2,032	2,006	1,961	1,566

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective March 12, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,032	2,006	19,009	13,542
Capability Utilization Rate	78.6	77.6	73.6	46.7

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.939	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 91.50	$ 91.83	$ 95.17	$ 72.83
No. 2 bundles	$ 62.83	$ 62.83	$ 63.17	$ 51.83

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$100.50	$100.50	$103.50	$ 77.50
No. 1 steel, Philadelphia	86.50	87.50	91.50	63.50
No. 1 steel, Chicago	87.50	87.50	90.50	77.50
No. 1 bundles, Detroit	95.50	95.50	101.50	76.50
Low Phos., Youngstown	99.50	99.50	104.50	69.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	79.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	111.50	111.50	111.50	112.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective March 12, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	70.00-72.00	70.00-70.50	3/9/84
Lead	25.00-28.00	24.00-28.00	3/7/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	51.00-53.00	51.00	3/9/84

ALUMINUM: 99.5%. COPPER (C) — cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.50
Calcium, ton lots, crown	$3.50
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$395.75
Indium, dollars per troy oz.	$2.43-$2.65
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$295-$305
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz	$9.95
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

March 5—579.60
March 6—579.14
March 7—577.68
March 8—575.70
March 9—578.61

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64⅝	60
Yellow brass	59	57¼
Red brass	61⅜	58½
Comm. bronze	62⅜	59
Mang. bronze	61½	58
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	64
No. 2 copper wire	54
Light copper	44

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	60
No. 2 copper wire	50
Light copper	40
No. 1 composition	56
No. 1 comp. turnings	54
Hvy. yellow brass solids	38
Hvy. yellow brass turnings	33
Radiators	46

Aluminum

New mixed clips	51	—52
Old sheet	50	—51
Old cast	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	42	—43
Mixed L.C. clips	37	—38
Old sheets and cast	35	—36
Borings and turnings	26	—27
Duraluminum clippings	28	—29

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	37	—38
Radiators	35	—36
No. 1 composition	44	—45
No. 1 composition turn'gs	41	—42
Cocks and faucets	30	—31
Clean heavy yellow brass	27	—28
Brass Pipe	29	—30
New soft brass clippings	44	—45

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE MAR. 12, 1984

(Effective March 12, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to $101.00
No. 2 hvy. melting	90.00 to 91.00
No. 1 dealer bundles	119.00 to 120.00
No. 1 factory bundles (auto)	125.00 to 126.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	113.00 to 114.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	54.00 to 55.00
Cast iron borings	53.00 to 54.00
Low phos. punchings plate	125.00 to 126.00
Heavy turnings	90.00 to 91.00
No. 1 RR hvy. melting	113.00 to 114.00
Rails 2 ft. and under	122.00 to 123.00
Scrap rails, random lgth.	107.00 to 108.00
RR specialties	121.00 to 122.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	590.00 to 600.00
18-8 turnings	490.00 to 500.00

Chicago

No. 1 hvy. melting	$ 87.00 to $ 88.00
No. 2 hvy. melting	81.00 to 82.00
No. 1 dealer bundles	112.00 to 113.00
No. 1 factory bundles (auto)	115.00 to 116.00
No. 2 dealer bundles	64.00 to 65.00
No. 1 busheling	109.00 to 110.00
Shredder scrap	106.00 to 107.00
Machine shop turn.	49.00 to 50.00
Mixed bor. and turn.	50.00 to 51.00
Shoveling turnings	60.00 to 61.00
Cast iron borings	61.00 to 62.00
Low phos. forge crop	122.00 to 123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to 133.00
Low phos. 2 ft. and under	127.00 to 128.00
No. 1 RR hvy. melting	109.00 to 110.00
Scrap rails, random lgth.	102.00 to 103.00
Reroller rails	112.00 to 113.00
Rails, 2 ft. and under	126.00 to 127.00
RR couplers and knuckles	110.00 to 111.00
RR car axles	134.00 to 135.00
No. 1 machinery cast	111.00 to 112.00
Cupola cast	105.00 to 106.00
Stove plate	106.00 to 107.00
Steel car wheels	119.00 to 120.00
Stainless	
18-8 bundles and solids	550.00 to 560.00
18-8 turnings	450.00 to 460.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 85.00 to $ 88.00
No. 2 hvy. melting	75.00 to 78.00
No. 1 dealer bundles	102.00 to 105.00
No. 2 dealer bundles	63.00 to 66.00
No. 1 busheling	102.00 to 105.00
Shredder scrap	95.00 to 98.00
Machine shop turn.	29.00 to 32.00
Mixed bor. and turn.	29.00 to 32.00
Shoveling turnings	48.00 to 51.00
Low phos. 5 ft. and under	100.00 to 103.00
Low phos. 2 ft. punchings	117.00 to 120.00
Electric furnace bundles	116.00 to 119.00
RR specialties	102.00 to 105.00
Rails, 2 ft. and under	115.00 to 118.00
Cupola cast	72.00 to 75.00
Heavy breakable cast	60.00 to 63.00
No. 1 machinery cast	99.00 to 102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to $ 69.00
No. 2 hvy. melting	65.00 to 66.00
No. 1 dealer bundles	95.00 to 96.00
No. 2 bundles	46.00 to 47.00
No. 1 busheling	94.00 to 95.00
Drop forge flashings	66.00 to 67.00
Machine shop turn.	46.00 to 47.00
Mixed borings and turn.	29.00 to 30.00
Shoveling turnings	47.00 to 48.00
Cast iron borings	49.00 to 50.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	460.00 to 470.00
18-8 turnings	360.00 to 370.00
430 bundles and solids	120.00 to 130.00

Youngstown

No. 1 hvy. melting	$ 90.00 to $ 93.00
No. 2 hvy. melting	72.00 to 75.00
No. 1 dealer bundles	103.00 to 106.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	98.00 to 101.00
Electric furnace bundles	91.00 to 94.00
Galvanized bundles	89.00 to 92.00

Cleveland

No. 1 hvy. melting	$ 80.00 to $ 83.00
No. 2 hvy. melting	50.00 to 53.00
No. 1 dealer bundles	100.00 to 103.00
No. 1 factory bundles	102.00 to 105.00
No. 2 bundles	30.00 to 33.00
No. 1 busheling	99.00 to 102.00
Machine shop turn.	13.00 to 16.00
Mixed bor. and turn.	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	126.00 to 129.00
Low phos. punchings plate	126.00 to 129.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	127.00 to 130.00
Rails, 18 in. and under	128.00 to 131.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	107.00 to 110.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00 to $ 75.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 busheling	89.00 to 90.00
No. 1 dealer bundles	89.00 to 90.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	25.00 to 26.00
Low phos. plate	102.00 to 103.00
Structural and plate, 2 ft. and under	102.00 to 103.00
Rails, 2 ft. and under	97.00 to 98.00
Scrap rails, random lgth.	77.00 to 78.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 82.00 to $ 83.00
No. 2 hvy. melting	72.00 to 73.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	70.00 to 71.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	40.00 to 41.00
No. 1 RR hvy. melting	89.00 to 90.00
Rails, random length	87.00 to 88.00
Rails, 18 in. and under	99.00 to 100.00
RR specialties	97.00 to 98.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	88.00 to 89.00
Cast iron car wheels	57.00 to 58.00
Rerolling rails	94.00 to 95.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 77.00 to $ 78.00
No. 2 heavy melting	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	57.00 to 58.00
No. 1 busheling	82.00 to 83.00
Shredder scrap	107.00 to 108.00
Machine shop. turn.	41.00 to 42.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	50.00 to 51.00
Electric furnace bundles	75.00 to 76.00
Elec. furnace, 3 ft. & under	80.00 to 81.00
Structural and plate, 2 ft.	111.00 to 112.00
Structural and plate, 4 ft.	105.00 to 106.00
No. 1 RR hvy. melting	105.00 to 106.00
Scrap rails, random lgth.	100.00 to 101.00
Rails, 18 in. and under	112.00 to 113.00
Angles and splice bars	105.00 to 106.00
No. 1 cupola cast	94.00 to 95.00
Unstripped motor blocks	74.00 to 75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to $ 74.00
No. 2 hvy. melting	67.00 to 68.00
No. 1 dealer bundles	88.00 to 89.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	29.00 to 30.00
Low phos. 18 in. and under	107.00 to 108.00
Rails, random length	87.00 to 88.00
Rails, 2 ft. and under	102.00 to 103.00
No. 1 cupola cast	76.00 to 77.00
Heavy breakable cast	39.00 to 40.00
Drop broken cast	92.00 to 93.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 49.00 to $ 51.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	500.00 to 520.00
18-8 turnings	400.00 to 420.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to $ 72.00
No. 2 hvy. melting	60.00 to 62.00
No. 1 dealer bundles	75.00 to 77.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	78.00 to 80.00
Shredder scrap	75.00 to 77.00
Machine shop turn.	14.00 to 16.00
Shoveling turnings	20.00 to 22.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	20.00 to 22.00

San Francisco

No. 1 hvy. melting	$ 48.00 to $ 50.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	37.00 to 39.00
No. 2 dealer bundles	19.00 to 21.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 52.00 to $ 54.00
No. 2 hvy. melting	42.00 to 44.00
No. 1 dealer bundles	41.00 to 43.00
No. 2 dealer bundles	21.00 to 23.00
Machine shop turn.	12.00 to 14.00
Shoveling turnings	10.00 to 12.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 73.00 to $ 75.00
No. 2 hvy. melting	62.00 to 64.00
No. 2 bundles	44.00 to 46.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 85.00 to $ 86.00
No. 2 hvy. melting	69.00 to 70.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	20.00 to 21.00
Crushed turnings	45.00 to 46.00
Shredder scrap	85.00 to 86.00
Cut structural plate 2 ft. and under	100.00 to 102.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	81.00 to 82.00

ORDERS ON TRACK IN JANUARY

Durable goods orders in the first month of 1984 bode well for the economy for the year. Sustaining the health of industry was a big increase in the demand for steel, according to the latest figures from the U.S. Commerce Department.

Some are calling the steel industry's 56.8 pct rise in January over December a "rebound," but the industry still believes it has a long way to go. New orders for steel in the first month of 1984 came to $5.8 billion compared with $3.7 billion in December 1983.

Overall, strong rises in orders for manufactured products in January leads to the belief that the economy is not losing its momentum. New orders for durable goods totaled $100.9 billion, up about 3 pct from the $98.2 billion registered in December. Metal cutting machine tools and household appliances were among those posting gains.

Metalworking machinery new orders in January were up 33 pct—$800 million in January versus $600 million in December. Machine tool orders totaled $191 million, a 26.2 pct increase over December's $151.3 million.

However, within that category metalforming machine tool orders were down 7 pct— $56 million in January compared with $60 million the last month of 1983. Metalcutting machine tool orders were up 47 pct, $135.1 million compared with $91.3 million.

The government's final January figure has been revised upward from a earlier report, which predicted the increase in orders to be 1.1 pct. Part of the upward movement resulted from a much-improved showing in non-defense capital goods. This area, a key indicator of future plans for plant and equipment spending, was up 2 pct in January compared with December.

Several economic observers say the strength of the non-defense category coupled with the upticks in 15 of the 26 categories shown is further evidence that the nation's economic recovery is continuing on track.

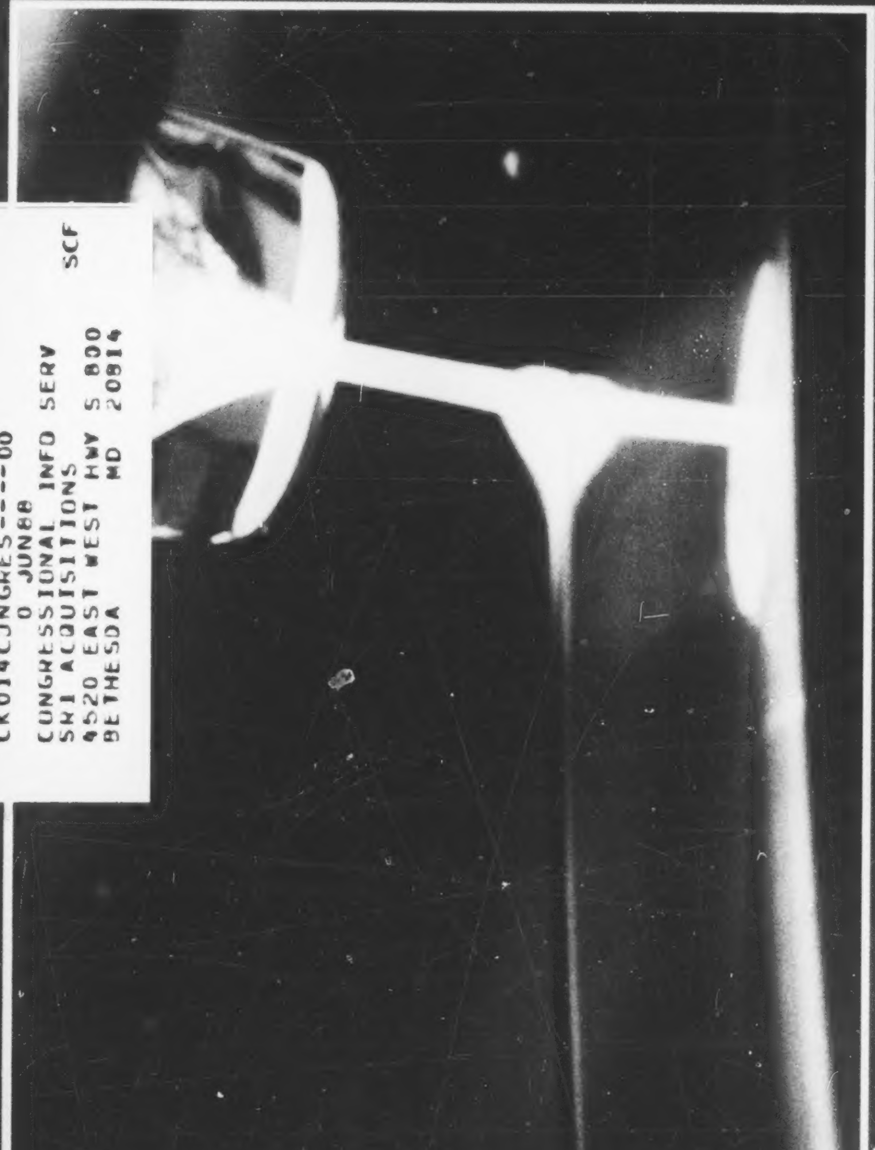
Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$321.6	$304.7	$303.2
Manufacturing, Total	4th Qtr.	115.0	111.1	110.2
Manufacturing, Durable Goods	4th Qtr.	53.5	53.0	50.5
Mining Industry	4th Qtr.	13.1	11.9	13.4
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Jan.	100.9	98.2	80.7
Shipments	Jan.	96.5	97.9	77.0
Inventories	Jan.	177.8	178.0	174.0
Unfilled Orders	Jan.	328.6	323.5	288.8
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Jan.	25.4	24.9	20.9
Capital Goods Producers, Defense Industries	Jan.	6.6	8.8	8.6
Primary Metals, Total	Jan.	12.7	10.7	8.3
Steel (SIC 331)	Jan.	5.8	3.7	3.5
Iron & Steel Castings (SIC 332)	Jan.	1.5	1.3	0.8
Nonferrous Metals	Jan.	5.4	5.7	4.0
Nonelectrical Mach.-Equip. Industries, Total	Jan.	16.8	16.5	13.4
Engines & Turbines	Jan.	0.9	1.0	1.0
Farm Machinery & Equipment (Shipments)	Jan.	1.0	1.2	0.9
Construction, Mining & Mat. Hdlg. Equip.	Jan.	2.6	2.8	1.9
General Industrial Machinery	Jan.	1.2	1.3	1.1
Fluid Power Equipment** (Index-1972=100)	Jan.	312.0	248.0	207.0
Metalworking Machinery	Jan.	0.8	0.6	0.7
Machine Tools, Total ($ Mill., Unadjusted)***	Jan.	191.0	151.3	91.9
Machine Tools, Metalcutting***	Jan.	135.1	91.3	57.1
Machine Tools, Metalforming***	Jan.	56.0	60.0	34.8
Electrical Mach. & Equip. Industries, Total	Jan.	15.7	16.0	12.0
Elec. Transmission Equip. & Ind. Apparatus	Jan.	1.8	1.7	1.4
Household Appliances	Jan.	1.6	1.2	1.3
Communication Equipment	Jan.	4.7	5.7	4.0
Transportation Equip. Industrial, Total	Jan.	25.9	25.5	21.7
Motor Vehicles & Parts (Shipments)	Jan.	17.0	15.2	10.4
Aircraft, Missiles & Parts	Jan.	6.8	8.9	8.9
Shipbuilding & Military Tanks	Jan.	0.9	0.2	1.5
Fabricated Metal Products, Total	Jan.	10.9	10.6	9.0
Instruments, Total	Jan.	4.7	4.7	4.0

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

CHILTON'S
April 8, 1988

IRONAGE

METALS PRODUCER



CK014CONGRES---00
0 JUN88
CONGRESSIONAL INFO SERV SCF
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

CASTING THIN STRIP

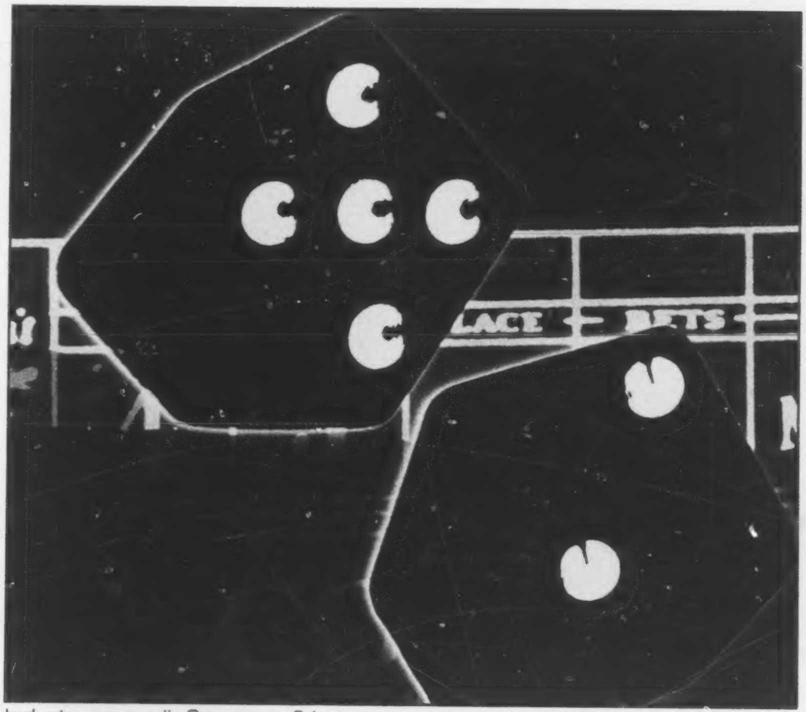
WHERE RESEARCH IN STEEL IS HEADED

Plus—

SECOND QUARTER FORECAST—INDUSTRY ON A ROLL

APRIL 2, 1984 VOL. 227, NO. 7

CHILTON'S IRON AGE METALS PRODUCER



Industry on a roll. See page 24.

Editorial 5
Something happened, now, what happens?

Newswatch 13
Justice Dept. approves LTV/Republic merger.

The Hot Spot 22
Hi-Tech without basic industry.

Second Quarter Forecast 24
Current recovery shows it has a life of its own.

Casting thin strip 52
A new approach in steel R&D.

Joint Research 60
What about limited research partnerships?

Materials Report 71
Inventories contribute to the steel recovery.

Price Trends 84
Producer prices rose moderately in February.

Next Issue: Seamless tube technology.

Departments

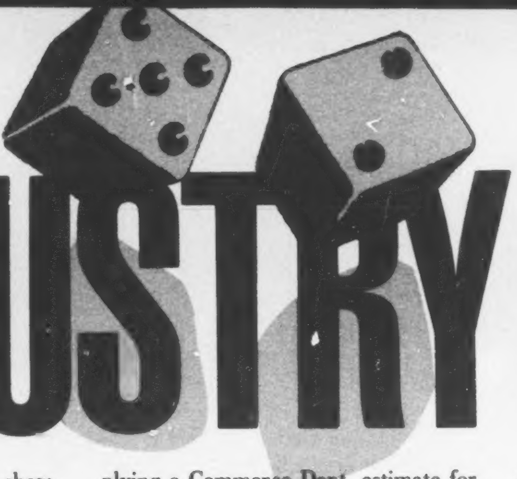
EDITORIAL STAFF **6**
SIGNED, SEALED AND DELIVERED **8**
INDUSTRIAL BRIEFS **21**
PRODUCT & EQUIPMENT REVIEW **64**
AD INDEX **74**
MANAGEMENT SERVICE CARD **75**
BUSINESS STAFF **76**
P&P DATA 3/26 **77**
FERROUS SCRAP **78**
STEEL PRICES **80**
STEEL PRICES **81**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc

BY JOHN D. BAXTER



INDUSTRY ON A

The current business recovery is showing it has a life of its own.

It is rolling along quite strongly in the face of high interest rates, an overvalued dollar, an erratic money supply and a monstrous and menacing Federal budget deficit.

This recovery has made fools of fretting Cassandras and heroes of a number of howling optimists.

At this point in time, a reasonable outlook is for strong economic growth this year to the tune of a 5 to 6 pct increase in real Gross National Product.

One bank economist who recently tore up an earlier low-figure forecast for 1984, said, "This may turn out to be a normal recovery after all."

If this, until-now maligned recovery, does turn out to be a normal one, it will run for about 45 months. That is the average duration for post-war recoveries. So, if the current business expansion runs a somewhat 'normal' course, it would be hanging around another 28 months. That would mean good days through to the third quarter of 1986.

The staying power of the recovery is of special interest to those companies in metalworking that produce capital equipment—and to their vendor companies. Outlays for capital equipment take a long time to catch up with economic recoveries. A short recovery period can be crippling to plant spending; a long one pretty well assures that big-tag spending will reach full bloom.

Capital spending, carried forward by the force of 17 months of economic recovery, is showing signs of coming to life in a big way.

One clear sign of this 'coming to life,' is seen in the latest U.S. Commerce Department quarterly survey of business executives on their plant spending intentions for this year.

The survey, which was taken in January and February, found that the executives planned to boost their spending by 13.6 pct over last year. After applying a Commerce Dept. estimate for an expected rise of 1.4 pct in prices of capital goods, spending would be up 12 pct.

It was durable goods producers who posted the brightest numbers on the forecast board for this year. They forecast an expenditures increase of better than 21 pct for the year over 1983.

If that wasn't good news enough, just 48 hours later, the Conference Board released good tidings in their latest quarterly survey of the 1,000 largest manufacturers on their fourth quarter 1983 capital appropriations.

In that closing quarter, manufacturers increased their setasides by 20.4 pct over the previous quarter. That was the biggest one-quarter jump since 1976. This increase excludes appropriations made by the petroleum industry.

What it adds up to is that plant spending, so critical to metals producing and metalworking is finally catching up with the overall recovery.

Inflation Worry

Fears of an overheated economy bringing back inflation are sounded mostly by those who forget how far down the economy had sunk. In the roughly three-year time period from January 1980 to November 1982, the U.S. economy was hit by 22 months of recession. There is no precedent in U.S. economic history for that much business contraction over a similar span of time.

At this point in the recovery, capital investment is the critical element.

But, along with the recent good signs and rosy surveys on capital investment, there have come warnings.

The Conference Board release pointing to strong fourth quarter appropriations, in a closing paragraph noted, "Interest rates remain high. If they should edge higher in the presence of government activity in credit markets to accommodate large Federal budget deficits the anticipated capital spending increases may not materialize."

So far, companies have been largely tapping internal funds to finance their capital outlays and this may not be enough to give these outalys real push and staying power. Long-term corporate borrowing has always in the past played a major role in expansions of plant investment.

Credit Confrontation

If corporate cash flow—retained earnings and depreciation can—remain strong, a credit market confrontation with the government can be averted. Or, at least, any confrontation could be minimized.

Averting a full head-on clash is important. After all, the government is already gobbling up more than 50 pct of all available credit. While moderate incremental gains in interest rates might not be enough to snuff out a capital investment recovery, a full-fledged credit crunch could likely do the job all too easily and quickly.

It now looks like the strength of the recovery will sustain corporate profits and cash flow and assure an adequate supply of funds to sustain capital spending at high levels.

So, some 10,000 executives told the Commerce Dept. they will be sharply stepping up their spending for plant and equipment this year.

And the 1,000 largest manufacturers told the Conference Board they made the biggest quarterly increase since 1976 in capital appropriations.

This makes the outlook downright rosy for U.S. capital goods producers and all those metals producing and metalworking companies that supply those producers.

The published surveys on all this big upcoming spending don't say **where** and for **what** the big spending will be directed.

Questions Asked

How much of the spending will go for foreign-made machinery, equip-

ROLL

ment and accessories?

How much of the spending will go for computers, office automation equipment and other 'information technology' capital goods rather than basic industries' capital goods?

Those 'whats' and 'wheres' of capital spending this year will have a great deal to do with just how much basic metalworking industries share in the anticipated 1984 investment spree.

Certainly, at this time, many machine tool builders remain cheerless in the midst of burgeoning domestic markets for their equipment. They see 36 pct of that market being grabbed off by imported tools.

The hope this year is that recovering world markets will lessen the intensity of penetration into domestic markets by offshore competitors. That seems likely to be the case.

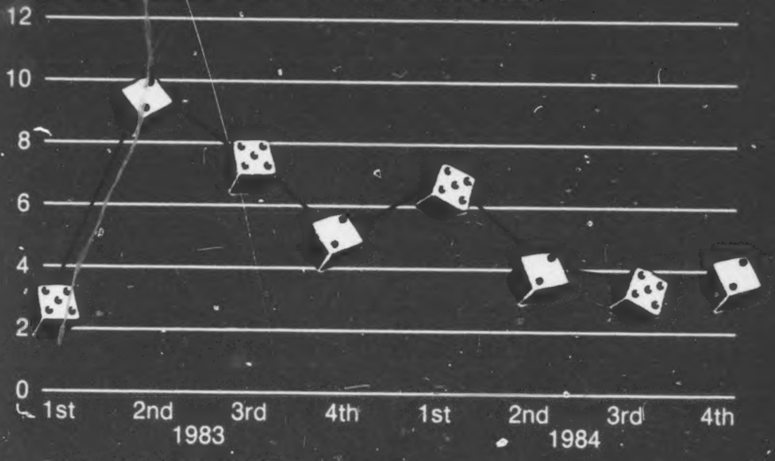
Just as certain as in imports, there has been a marked trend in recent years away from basic industries' capital goods market growth towards the capital goods of 'information technology' industries.

A strong trend running well prior to the current recovery shows a new 'mix' in capital investment has occurred in U.S. industry. For example, in the late 1960's, outlays for basic industry capital equipment and facilities accounted for about 30 pct of total U.S. business fixed investment. By 1982, that share was down to 18 pct.

Still, in current capital investment, and in plans for further investment this year, the basic goods industries are holding their own very well. According to the Commerce Dept. survey, executives in such basic industries as autos and primary metals are calling for the biggest increases in plant spending outlays this year.

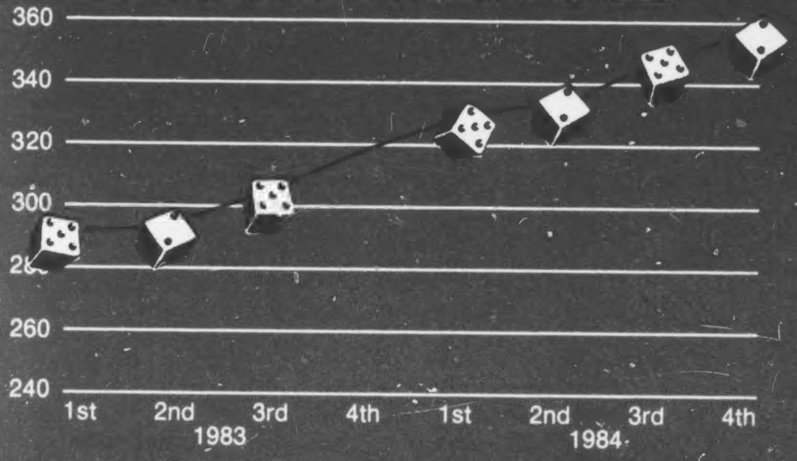
On balance, it looks like the 'pros' on capital spending and U.S. metalworking industry, recovery outweigh the 'cons' for 1984. ☐

GNP
Pct Increases at Annual Rates 1972 Dollars



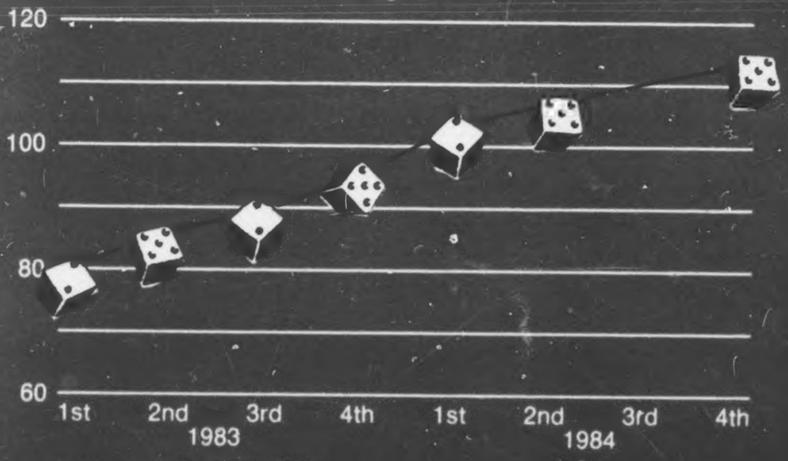
Source: U.S. Commerce Dept.

Plant Spending
Billions of Dollars, Seasonally Adjusted Annual Rates



Source: U.S. Commerce Dept.

New Orders, Durable Goods
Billions of Dollars, Mo. Averages

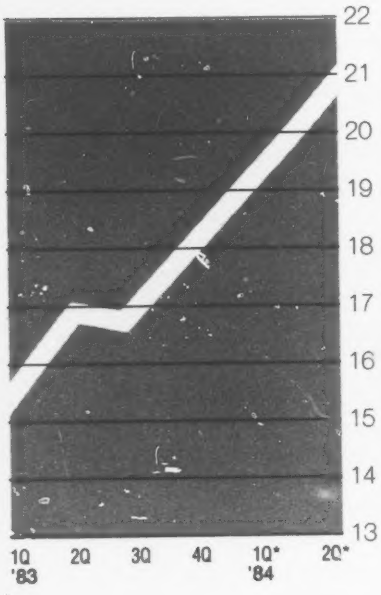


Source: U.S. Commerce Dept.

STEEL

Just on the basis of seasonal effects, shipments should rise to 21 million tons in the second quarter.

Steel Shipments
Millions of Tons



Source: AISI *IA estimate

The steel industry is on the brink of a strong market. Demand is moving up in nearly all product lines. It would not take much of an added nudge upward to tighten supply and create a snowball effect in the market.

There is no guarantee this nudge will be provided. The steel recovery is still extremely vulnerable to any easing in the big consumer industries—automotive, housing, and appliances.

These industries are sensitive to interest rates and steel executives wince when they hear talk from Washington that it's time to slow things down.

The capital goods sector is reviving, but it will probably be another six to eight months before heavy industrial activity moves into high gear. If the consumer recovery is aborted before then, the steel market will fall flat.

On the other hand, a normal economic pattern should bring prosperity to steel companies soon. There was a sharp rise in orders for bars in the first quarter. Demand for carbon and stainless sheet remained strong. Tool steel had a decisive improvement.

Most other products are moving up slowly from depressed levels. There has been a modest rise in orders for plate. Demand for oil country seamless pipe continues to rise. Some important linepipe activity is developing and demand for welded pipe has improved. The stainless bar business is better but still not good.

The various product trends added up to shipments of about 19 million tons in the first quarter. That was up from 18 million tons in the fourth quarter of 1983 and from 15 million tons in the first quarter of 1983.

Just on the basis of seasonal effects, shipments should rise to 21 million tons in the second quarter. With any kind of boost in the economy, shipments should go higher.

On paper, the mills have plenty of capacity to meet any likely demand. Raw steel output was under 80 pct of reduced capacity in mid-March.

However, demand is not evenly distributed. Sheet mills were unable to keep up with orders in the first quarter. Winter weather caused some loss of production. Deferred maintenance projects started cropping up.

In addition, there are bottlenecks. Sheet mills have plenty of rolling capacity, but they are short of slabs at some locations and are squeezed for annealing and galvanizing capacity at others.

Because of cutbacks and layoffs, the industry will probably run into more production snags if demand surges. There could be a quick switch from a buyer's to a seller's market.

That hasn't happened yet. Price cutting has continued in all product lines, including sheet. Despite better volume, the price situation resulted in considerable red ink in the first quarter.

Domestic producers trace their price problems partly to the influx of foreign steel. Over 2 million tons were imported in January. The foreign volume keeps steel users from getting excited about possible domestic shortages.

The import situation also enters into the restructuring efforts of the industry. In their merger proposals, steel men argue that foreign competition should be considered in considering the effects of domestic concentration.

This argument is seconded by people like Commerce Secretary Malcolm Baldrige, who want to permit mergers but minimize the curbs on imports.

On the other side, the antitrust people contend that domestic steel companies are already protected from foreign competition and are seeking to lessen domestic competition through mergers.

So far, the net effect of the compartmented government approach has been to block steel mergers and also deny effective protection against imports. Despite formal and informal trade agreements, steel imports could rise from 17 million tons in 1983 to over 19 million tons in 1984.

NONFERROUS

The tempo began to quicken in nonferrous metal markets as the first quarter drew to a close and the benefits of the business recovery began showing signs of spreading from aluminum and zinc to copper and lead.

Most of the strength continued to come from the consumer sector, particularly automobiles. The nickel, molybdenum and copper producers were still watching the horizons for signs of a real pickup in the capital goods sector.

With U.S. car production in the first quarter running about 500,000 units higher than the same 1983 period—roughly 43 pct—a lot more nonferrous metals were being chewed up. The gain was worth about 33,000 tons to the aluminum producers and it meant more consumption of copper, zinc and lead.

Toward mid-March, copper showed new signs of springing to life, even without the still-anticipated but perhaps delayed pickup in capital goods activity. The cathode price pushed through the 70¢ a lb barrier and headed toward 75¢ a lb, which is where it was in mid-September before the last recovery attempt fizzled out. As things turned out, September was close to the start of a surge in hedge market copper inventories that carried straight through the balance of 1983. After January, however, Comex and London Metal Exchange stocks declined nearly 125,000 tons, or about 14 pct, as the latest price surge began picking up steam.

Earlier in the quarter, the U.S. producers launched another bid for import quota protection. (Former President Jimmy Carter "pocket vetoed" a favorable recommendation from the U.S. International Trade Commission the last time around.) That now requires another review by the ITC over a six-month period, which likely will be seeing an improved trend in copper prices and consumption. What the U.S. copper companies are after is insurance that they will be able to recover market share in the home market, but at better prices than were available last year.

Over on the aluminum side of the business, the downtrend in inventories was beginning to slow up rounding the bend into 1984, reflecting steadily increasing production beginning in the second half of 1983. There was some faltering in free market ingot prices toward mid-March, followed by signs of slower recovery.

U.S. producers are projecting a 9 to 10 pct gain in deliveries this year, which would put the industry back on the record-breaking track, shipmentwise. Price recovery started to spill over from ingot to mill products, but slowly because of competitive factors.

The transportation sector is expected to provide the aluminum producers with the biggest part of their anticipated gain in shipments this year, tonnagewise and percentage-wise. Forecasts, backed by the surge in car and truck production, call for a jump of about 500,000 tons, or over 20 pct. Shipments to the container and packaging sector are seen rising about 4.5 pct.

Increased car production is helping zinc consumption and prices, but a tightening supply situation is given most of the credit for the first quarter price gains. U.S. refiners' stocks have been under a one-month supply since last July and the industry doesn't look for any significant increase in U.S. output until next month when an idle smelter starts coming back onstream.

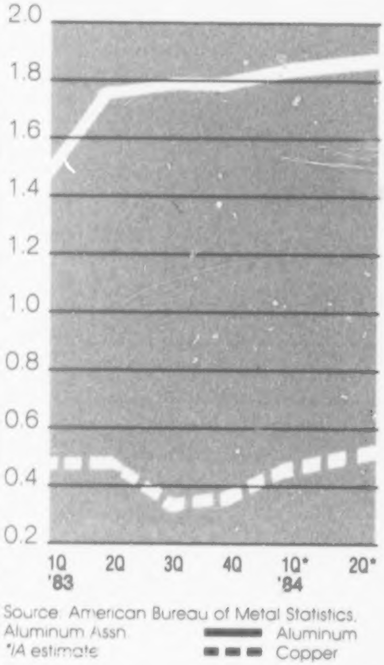
Overseas markets also have been firming up and special high grade zinc supplies were said to be tightening to a point where further price increases were possible before midyear.

Lead prices improved modestly in the first quarter, due largely to the impact of severe weather on replacement storage batteries. Refiners' stocks are well below year-ago levels and far from burdensome, but they were tracking upward as 1984 began. Better grades were moving into a tight supply situation as the first quarter drew to a close.

U.S. (aluminum) producers are projecting a 9 to 10 pct gain in deliveries this year....

Nonferrous Metals Shipments

Millions of Short Tons

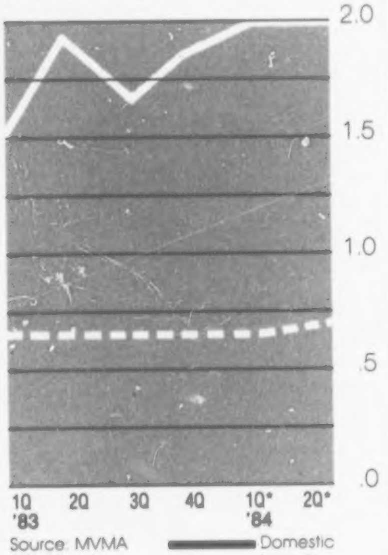


Source: American Bureau of Metal Statistics, Aluminum Assn.
*IA estimate

AUTOMOTIVE

'The odds for the present upturn in auto sales continue to look promising.'

Automotive, Sales
Millions of Units



Source: MVMA
*IA estimate

U.S. automakers probably will sell as many passenger cars in the second quarter as they did in the first quarter: about 2 million.

After building 2.2 million cars in the first quarter, Detroit likely will produce between 2 million and 2.1 million automobiles in the second quarter.

Detroit has not sold or built 2 million cars in a single quarter since 1979. Auto production in the first quarter of this year exceeded the first quarter of 1983 by almost 46 pct. Sales in the first quarter of this year were about 35 pct higher than last year.

"The economy today is on a roll," the president of one Big 3 automaker said recently. "The odds for the present upturn in auto sales continue to look promising."

Current dealer orders at GM are the highest in that company's history.

Sales in the second quarter won't exceed last year's second quarter by those 35-pct margins.

"Clearly, our sales can't continue to be so much higher than year-earlier sales," said the auto executive.

February marked the twelfth consecutive month in which the industry's sales surpassed the level reached in the same month one year earlier.

"Second-quarter sales will be about 14 pct higher than last year's," said an auto analyst for one car company.

Another analyst predicted that the seasonally adjusted annualized rate (SAAR) will fall from 8.15 million domestic sales in the first quarter to 7.75 million in the second quarter. Since he figures that the second quarter accounts for 27 pct of annual sales and the first quarter 26 pct, the analyst predicts that actual sales in the second quarter will slightly exceed those in the first.

"The first quarter was too exuberant," said the analyst. Auto sales in that period rose above his trend line because sales in October and November 1983 fell below it.

"But we haven't seen sales pushing into such high pinnacles that low bottoms are certain to follow," he added.

Most auto plants are working at full capacity and overtime. The market is absorbing most of the small cars produced and could absorb even more large cars. Dealer inventories fell from a 60-day supply at the end of February to a 56-day supply a month later.

"Customer confidence and disposable income are as high as they can get," said one analyst.

One automaker's forecasters expect both the prime interest rate and vehicle financing rates to remain about constant through 1984.

"The prime could rise by one-quarter or half a point," said one forecaster, "each quarter this year. From today's 11-point prime, we could reach 12 points by year-end."

"Some economists," noted one automotive president, "say that high interest rates in the fourth quarter will spoil the recovery. But they're the same ones who mistakenly said that car sales in 1983 would be poor."

Automakers generally expect sales and production to continue until the middle of 1985 at the same rate as in the first half of 1984. They foresee a slowdown in the second half of 1985 and a downturn in 1986.

One big reason for their confidence is the average age of the vehicle on the road today: seven years.

Under the "voluntary restraints," Japanese automakers will increase the number of vehicles shipped to the U.S. between April 1, 1984, and March 31, 1985: They'll land 1.85 million passenger cars and 91,000 multi-purpose vehicles, such as Subaru Brats and Toyota station wagons. In the year ending March 31, 1984, the Japanese exported 1.68 million passenger cars and 82,500 multi-purpose vehicles to the U.S. The rise in Japanese imports will push quarterly sales of imports to the 700,000 mark for the first time.

MACHINE TOOLS, FLUID POWER

MACHINE TOOLS—Machine tool makers remain an unhappy lot. While other industries have returned to the good old days, machinery makers are still waiting for the end of the worst recession in decades.

Business is up, in some lines by as much as 13 pct over late 1983 figures, and the expectations for the rest of 1984 are for continuing increases. The problem is it will take, at present rates, many quarters of such increases to return to the "good old days."

So far, this consumer-led recession has not nudged capital goods customers much, machine tool companies report. The long-awaited surge in the capital goods markets is still awaited.

"It will remain slow for us as long as perceptions, and realities, about interest rates remain high," said one industry leader. "Our business is based upon customers long-term confidence about production. A system, even a standalone machine today is a very, very expensive proposal. They aren't bought without beliefs in rather long-term use," he adds.

So, over the machine tool industry is one major cloud. Is the recovery real, or is it a consumer binge only?

Other clouds continue to float in from Asia. Already, Japan and a few other Pacific Basin countries have upwards of 50 pct of some segments of the U.S. market. That kind of import penetration has some U.S. builders wondering about the future of the U.S. machine tool industry.

Still, the first quarter as well as the second are expected to be up by 12 or 13 pct over 1983's corresponding quarters. The mystery is the rest of 1984.

However, long-term and worldwide, machine tool makers probably are more optimistic than ever. The systems that can now be built are so productive that they must be built in terms of competitiveness. The question is not a matter of technology, but whose and where?

FLUID POWER—The fluid power market is continuing an uptrend that began in the second quarter of 1983 and has been gaining ever since.

From a turning point in May 1983, fluid power orders had climbed 43 pct over the year-ago period by last July and were continuing to rise.

First reports for 1984 showed the improvement over the year-ago period was beginning, finally, to moderate a little. But the first quarter of 1984 should be up at least 16 pct over the last quarter of 1983. The second quarter is good for another 10 pct increase.

Earlier, *Iron Age* pointed out that by year-end the cumulative gains for 1984 should amount to at least 20 pct over 1983 and near the $5 billion sales mark. The industry peak in 1980 and 1981 was more than $6 billion.

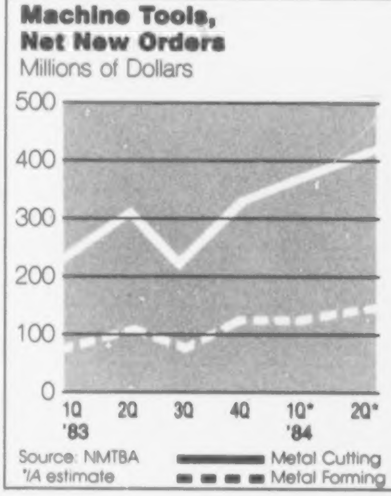
Hydraulic systems, the industry's biggest product area, have been strong since last June, though December sent a cold chill through some quarters. Orders for hydraulic equipment dropped more than seasonally below November. That was the dark side, but the bright side was that hydraulic was scoring remarkable order gains over the year-ago period, which would surprise a lot of general economists when they began looking at the gains in industrial orders in the fourth quarter.

The recovery has been strong enough and sharp enough to make deliveries a problem in some fluid power plants. That may check some gains in the first and second quarters.

Pneumatic fluid power showed less year-to-year gains in the closing months of 1983, only because it hadn't dropped off as much as hydraulic power. It has been gaining over the year ago period and continued to do so even during the December order glitch. In the first months of 1984, pneumatic orders appear to have hit their highest rate in the past four years.

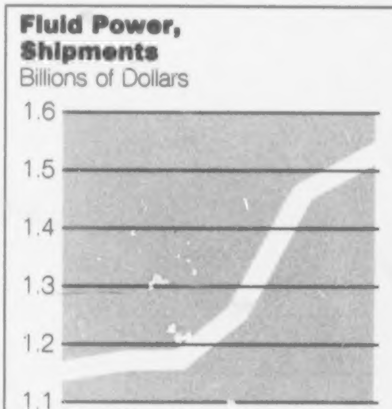
For fluid power in general, a strong first half is well under way.

. . . over the machine tool industry is one major cloud: Is the recovery real or is it a consumer binge only?



Machine Tools, Net New Orders
Millions of Dollars

Source: NMTBA
*IA estimate



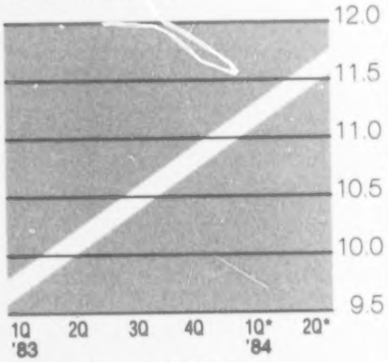
Fluid Power, Shipments
Billions of Dollars

Source: Dept. of Commerce and NFPA
*IA estimate

COMPUTERS, INSTRUMENTS & CONTROLS

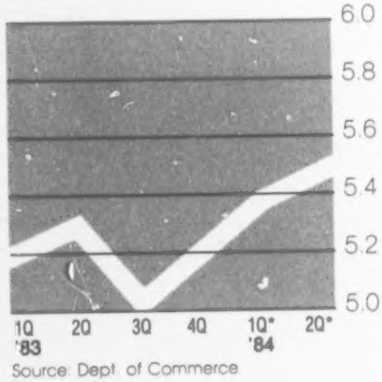
The personal computer and small computing systems spearhead growth. . . .

Computers, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Instruments & Controls, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

COMPUTERS—By industry standards, 1983 was an off year. But based on first quarter 1984 sales, the computer industry is again on the fast track.

First quarter shipments are up from the year earlier period and second quarter figures should be even stronger as the U.S. continues to work its way clear of the recession. The second half of the year will be stronger as more orders come in from a recovering European marketplace.

The personal computer and small computing systems continue to spearhead industry growth for the first half of 1984. These low-cost systems have been snapped up in recent months, especially by the smaller businessman, who is making a determined effort to join the computer age.

The strong growth of the superminicomputers is expected to continue. High-powered microcomputers or "supermicros" are assuming tasks once reserved for larger computers.

The computer-aided design/computer-aided manufacturing (CAD/CAM) market is continuing its rapid expansion through 1984. Reportedly, the market is growing at a rate of 38 pct a year. A major effort in 1984 by U.S. management to improve manufacturing operations will mean increased purchases of computers for CAD/CAM and other automated manufacturing operations.

The ongoing deregulation of the telecommunications industry will be changing the shape of the computer industry in the months ahead. Several computer manufacturers are broadening their product lines in order to compete successfully as these markets merge.

Not everything in this year will be sunshine for computer sales. Export markets continue to shrivel up, while foreign computers and computer parts gain larger shares of the U.S. market. A lingering recession overseas plus the sustained strength of the U.S. dollar has halted export growth.

INSTRUMENTS & CONTROLS—Instrument and control sales improved slightly in the first quarter of 1984. The second quarter should be better.

Product shipments dropped 4 pct in constant dollars in 1983. This year should show a 1 pct or 2 pct improvement. Higher levels of capital spending usually signal increased purchasing of instruments for measurement, analysis, and control. Forecasters see major increases in capital spending throughout 1984. Capital expenditures, which dropped from $55 billion in 1982 to $52 billion in 1983, are forecast to reach $60 billion in 1984.

How much of this spending will be done by the primary metals industries and other major buyers of controls is difficult to determine. The last quarter of 1983 and the early months of 1984 saw little increase in capital spending by basic metals producers.

Exports, which account for more than one-quarter of instrument industry's sales, are an important part of the profit picture. However, exports over the past two years have been down. In 1983, exports dropped 2 pct to $4.7 billion. A slow recovery by Europe and a dollar that gets progressively stronger are the two major stumbling blocks to higher sales. Also, Third World countries, such as the Arab nations which use a lot of controls for oil production, continue to experience hard times.

The scientific instrument market reportedly will grow by 1 pct in 1984. Aircraft instruments will see little demand, although defense-related products should pick up during the next several months. The pickup of laboratory and scientific instrument sales should keep pace with the rest of the economy.

Measuring and controlling instrument shipments will improve 1 pct in 1984. Major markets such as basic chemicals, metals industries, electric utilities, municipal sanitation works, and petroleum refining show little signs of improving.

INDUSTRIAL COATINGS, PLASTICS

COATINGS—Shipments of industrial coatings likely will rise from 84 million to 90 million gal from the first to the second quarter of this year. That's because of the continued health of the diverse industries that apply coatings to their products: appliances, automobiles, containers and buildings.

"We're on the brink of a big upturn in the industrial-maintenance market," said the vice president of one large East Coast supplier of coatings. "In both downturns and upturns, industrial maintenance lags the economy by about a year.

"When the downturn starts, industrial managers continue to do routine maintenance. A year into the downturn, they chop their budget for maintenance. A year into an upturn, they order more coatings.

Auto production will drop from 2.2 million to 2.1 million or 2 million units from the first to the second quarter. That will mean a slight dip in shipments to the automakers.

The coil coating industry should grow faster than the economy in the second quarter. It grew by almost 20 pct in 1983. One analyst expects shipments of both precoated aluminum and steel to increase by double-digit percentages in 1984.

"Coil-coated metals for cars and buildings," said the analyst, "will grow faster than the economy because those markets were depressed much earlier."

One market for coil coatings that should register big growth in 1984 is appliances. Finishing metal appliances is a production bottleneck with major costs. Many appliance makers are doing major retooling, so now's the time they're most likely to cut the finishing costs by ordering precoated metals.

Shipments of coated aluminum coil to the building and container industries should rise, but not at the rate of the economy, said the analyst. These are the two biggest markets for coil-coated aluminum.

PLASTICS—Last year was a banner year for plastics and 1984 probably will see even further improvement.

The first quarter sales and captive use of plastic resins posted a 200-million-lb increase over the fourth quarter 1983. That translates to a 7 pct increase in volume. The second quarter is expected to move up similarly.

Both engineering plastics and reinforced plastics (including composites) are selling at faster rates than others in this huge family of materials.

At the recent Reinforced Plastics/Composites Expo '84, an industry spokesman said that the industry is looking to top the 2-billion-lb "good old days" of 1978 and 1979.

The forecast for reinforced plastics is 2.155 billion lbs in 1984. The record is 2.046 billion lbs in 1979.

To no one's surprise, reinforced plastics continue to be extremely competitive both with steel and aluminum. These materials have come off a 475-million-lb fourth quarter and are completing a 510-million-lb first quarter 1984. The industry is looking for another jump—perhaps up to 525 million lbs—in the second quarter 1984.

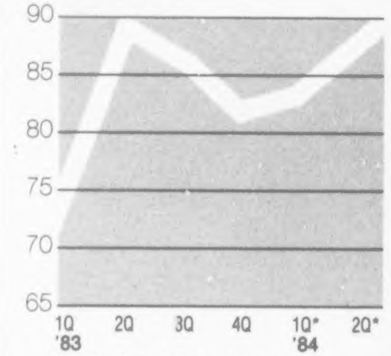
The largest single market for reinforced plastics is automotive body panels. Only time will tell when some of the newer applications for RP materials in the automotive industry will catch on.

Perhaps, this year. If they do, steel and aluminum will lose out. Industry pundits look for a healthy 18 pct increase for reinforced plastics this year in automotive.

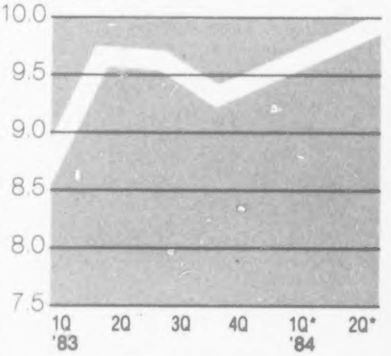
A variety of new applications will open up this year in the improving construction industry. Everything from doors to gutters are targets.

The tremendous growth in the use of RP pipe is slowing down, but it's still moving ahead at a rate of 12 pct. In the marine industry, analysts look for reinforced plastics to regain some of the business lost to aluminum, thanks to the development of a new resin.

Coil coating should grow faster than the economy in the second quarter.


Industrial Coatings, Shipments
Millions of Gallons

Source: Dept. of Commerce
*IA estimate

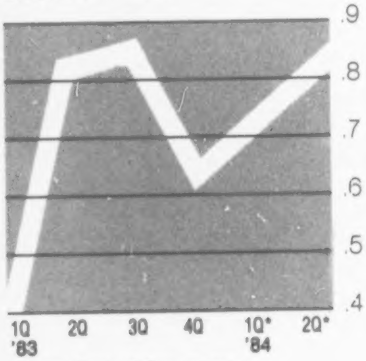

Plastic Resins, Sales & Captive Use
Billions of Lbs

Source: SPI Committee on Resin Statistics, compiled by Ernst & Whinney
*IA estimate

CONSTRUCTION, FARM EQUIPMENT

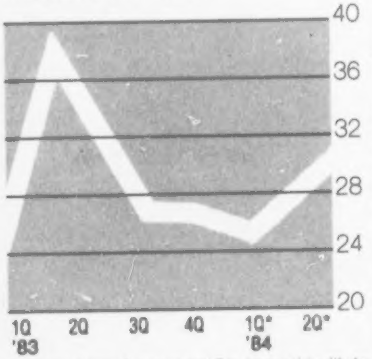
The first sign of recovery was visible in the highway equipment market. That spread to lighter equipment lines . . . .

Construction Equipment, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Farm Equipment, Wheeled Tractor Sales
Thousands of Units



Source: Farm & Industrial Equipment Institute
*IA estimate

CONSTRUCTION EQUIPMENT—The builders of construction machinery were beginning to feel better about 1984 even before the selling season begins.

For the second quarter, some industry sources suggest, equipment shipments will be up 20 pct over the first quarter level. There's still argument over that figure, but little or no dispute that the industry will be on the upswing.

Distributor sales, which will be the key to 1984 machinery manufacturing schedules, posted gains during much of 1983. That has cleaned out excess field inventory, though some machinery builders argue there is still too much finished equipment out in the distributor-dealer yards. But since 1982, dealers have been buying less equipment than they were selling.

The first sign of recovery was visible in the highway equipment market. That spread to lighter equipment lines as housing starts improved during 1983 and into 1984.

Caterpillar Tractor, the industry's biggest member, is continuing its recall of 3,200 employees at nine manufacturing plants, an indication that the market now looks solid enough to permit some production increases.

The Caterpillar recall actually began at the end of the fourth quarter of 1983 and will continue through the end of April. Other equipment builders are also calling back some employees.

In part, this is due to the permanent closing of some construction machinery plants during 1983. There isn't as much capacity as in the boom 1980 period. But it also means that builders are watching the decline in field inventories and feel it's time to make a manufacturing move.

Earlier, *Iron Age* forecast a 14 pct gain in construction machinery shipments this year. If the seasonal slowdown in the second half of 1984 is less than usual, that increase might surpass the projected 14 pct level for the year—closer to a 20 pct gain.

FARM EQUIPMENT—Last year, the farm machine builders were laboring to clear a glut of tractors in dealer-distributor inventories. Manufacturing levels never represented the actual level of retail sales during that period.

Normally, tractor sales in February tend to drop below January, often by as much as 25 pct. This past February, they actually rose 2 pct, or well over the historic seasonal pattern.

The current *Iron Age* outlook foresees a rise of more than 20 pct in the second quarter over first quarter tractor sales. The first quarter may be well over the current sales forecast of about 24,000 wheeled tractors at retail.

In the first two months, if the early tractor sales data holds, retail sales were up 16.6 pct over the year ago period, even though wheeled tractors in the 100 hp to 140 hp are lagging badly behind their 1983 pace.

Another big ticket item is still having trouble: Combines in the first months of 1984 were running far under the year ago period and making one of the poorest showings of any single equipment line. Harvest equipment is a seasonal market and doesn't begin to sell until later in the second quarter.

By contrast, a few short-line items, like planters, reportedly are in short supply for the spring selling season.

Short-line farm machine manufacturers, who build just a few products and often market part of their output to the big full-line farm machine companies for resale, did relatively better even in 1983. Their forage and tillage equipment sales were in the first wave of the farm equipment recovery, well ahead of tractors, the industry's bellwether product.

The original forecast of a 15 pct gain for farm equipment in 1984 may prove low in the unexpected early January strength. The rebound has surprised some farm machine builders. They were raising schedules in some product lines, but may have to think bigger.

OIL COUNTRY, MINING EQUIPMENT

OIL COUNTRY—A small but continued upturn in shipments of oil country tubular goods should continue through the first half of 1984. Industry officials are taking heart at statistics that show inventories declining some 20 pct in the last half of 1983. Many believe if drillers and distributors don't move to replace dwindling stocks soon, supplies could tighten up by the end of the second quarter.

Another positive sign for the industry is the domestic rig utilization rate. Most officials predict a rise of between 8 and 10 pct in the 1983 average of 2,230.

"The current economic recovery, the improved outlook for crude oil price stability, the normally cold winter and an improving cash flow situation for the major oil companies all point to a better year for the OCTG suppliers," one industry official predicted.

Other officials point to indications that the domestic oil and gas industries are emerging from the sharp, downward cycle that began early in 1982. But they caution that a full recovery for OCTG suppliers probably won't occur until 1985.

Instead, the second quarter of 1984 will emerge as an harbinger of the transitional path the industry will take for most of 1984. The severe discounting that has affected the industry over the last two years should end. Inventory holes may appear in some product categories since some inventories currently on hand can be used only for limited application or one situated in inconvenient locations.

However, the long-lasting uncertainty about pricing has kept many from building up inventories. If the projected rig count is accurate for 1984, remaining inventories of OCTG will be cleared up by the end of the year. While that fact certainly bodes well for the industry, it is not yet clear whether distributors and drillers will commit to substantial new purchases by June.

MINING EQUIPMENT—Mining equipment manufacturers are still in the doldrums, particularly those who make coal processing machinery. "Our hope," said one, "has always been the sustained use of coal."

Coal usage throughout the country has been modest, even with such a memorable winter. Few homes use coal anymore and under all that snow was an industrial recession. "So we see a 1984 that looks more like 1983 than 1982," he added. Two years ago was the last big year for the coal industry.

What would spur a coal mining equipment upturn, is obviously an increase in the burning of coal. Two fickle large markets exist: air conditioning and the kind of coal that industry, particularly steel, uses. The other markets for coal, in general, are not cyclical. Consumer power consumption, except for air conditioning, is steady. "So what we always hope for is a boom in steel during a hot and humid summer," quips one industry expert.

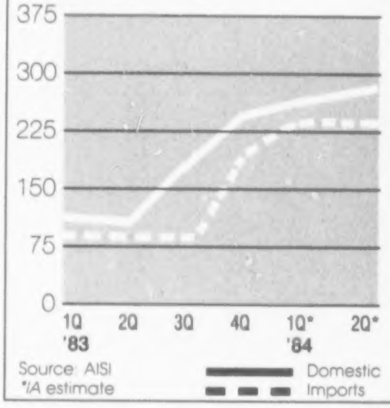
Nobody ever knows about the weather and, these days, few will predict much about steel either. So coal companies are running lean and so are their suppliers.

Overseas activity in iron ore has been much more intense than in the old ranges of the Great Lakes for years. Certain U.S. companies have been sharing in the development of large projects overseas for several years. "In fact," said one, "that's been about our only business since the late 70's."

Will domestic iron ore mining ever return to levels of the not-too-distant past? Most experts say no. Iron ore, as almost everyone knows, has only one market. Iron ore mining in the U.S. will return to the tonnage levels dictated by steelmakers. So the real question for the iron mine supplier companies is where is American steel going? The "imported slab trend is a potential disaster for us," said one mining company president.

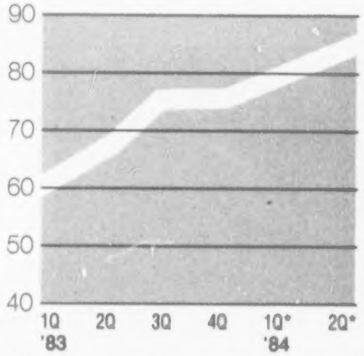
Discounting that affected the industry over the last two years should end.

Tubular Goods, Shipments
Thousands of Net Tons



Source: AISI
*IA estimate

Mining Equipment, Sales
Millions of Dollars

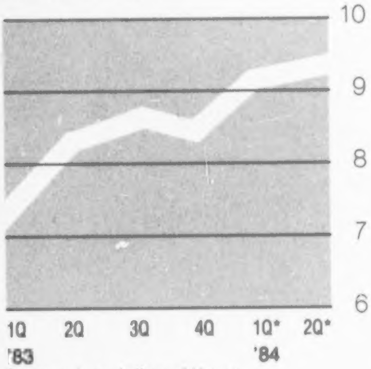


Total U.S. and export figures, based on present dollars; includes continuous miners, mobile loading machines, shuttle cars and cutting machines.
Source: Mining Equipment Manufacturers
*IA estimate

APPLIANCES, MATERIAL HANDLING

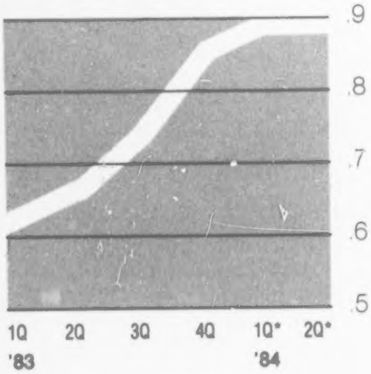
First quarter sales indicate little slackening of last year's record pace.

Appliances, Shipments
Millions of Units



Source: Association of Home Appliance Manufacturers
*IA estimate

Materials Handling, Shipments
Billions of Dollars



Source: Material Handling Institute
*IA estimate

APPLIANCES—Appliance sales were strong last year and will remain robust though the second quarter and the rest of this year.

In 1983, more than 32 million major household appliances were shipped. The figure, a 21 pct increase over 1982 totals, represents the greatest annual percentage increase for the appliance industry. This rapid rate of growth is not expected to hold up through 1984, but first quarter sales indicate little slackening of last year's record pace.

Early first quarter figures show unit sales continuing to grow at a rate near 20 pct. Industry observers see sales for the entire year increasing from 4 pct to 12 pct. Even with only a 4 pct pickup, 1984 unit shipments will be the second highest in industry history. Last year was the best year for the appliance industry since 1979.

Industry success in 1984 will be due to two major factors: a continuing desire for new houses and a growing need to replace worn-out appliances. Since about 20 pct of all major appliances sold go into new homes, the growing number of housing starts in January and February bodes well for the industry. Construction of new homes and apartments rose 11.2 pct in February, an unexpectedly high figure in view of continuing rise in interest rates.

While such jumps in new construction will not last, some industry observers are predicting that housing starts will reach 1.8 million in 1984, up from 1.7 million in 1983.

With the lifting of the recession, consumers are beginning to open up their wallets to buy new products to replace their aging appliances. At present, many appliances are nearing their 15th birthday. Demand is also rising for computerized appliances.

Despite the sales gains, industry officials fear mushrooming government deficits could drive up interest rates of mortgages and halt housing starts.

MATERIAL HANDLING—According to the numbers, the recession in the material handling industry has been over for a while. The numbers for the first quarter of this year confirm that. They're up and up quite a bit.

"We expect a good 1984," said one industrial truck maker. "If certain events do come to pass as well in 1984, we expect a very good year."

Those certain events, he explained, are matters of the Federal deficit and inflation. "If both are perceived as controlled, I think we're entering a period better than a boom."

Many material handling companies expect the first half's numbers to be 15 pct above the first half of 1983. A few expect 1984 to be a banner year, particularly if capital spending picks up where the consumer leaves off.

And, except for industrial trucks, the industry has so far existed in the domestic market immune from the foreign competition that has decimated other manufacturers. According to industry sources, that will remain the case indefinitely "because so much of this business is custom."

"We seeing a normal recovery," added one company president. "We are planning for a year of increasing business and don't expect the downturn that some economists are predicting later this year."

Others in the industry aren't so optimistic, but few are truly pessimistic about the rest of 1984.

"Our business," said one large systems maker, "is not nearly as cyclical as other industries because our market includes all of warehousing from steel to semiconductors.

What worries the industry is what worries the rest of the business community. Is the recovery headed for a stall and another slump? Most material handling equipment makers come down on the optimistic side as the second quarter's numbers start to show up better than the first.

CASTINGS, FORGINGS

CASTINGS—Despite a hesitation in December, foundries entered 1984 on a much stronger note.

This is true of ferrous castings shipments, which have risen more than 25 pct over the year ago period in the first quarter and should add a little more in the second quarter. On a short-term forecast, that means the first quarter is up 6 pct over the last quarter of 1983. It should advance another 6 pct or more in the second quarter.

Aluminum castings are doing well, and aluminum foundries could ship 20 pct more castings by weight in 1984 than were shipped in 1983. Some have shot up as much as 40 pct over the year ago period.

Copper-based castings are having a fairly good first quarter and should advance again in the second quarter.

Ferrous castings, nevertheless, are showing improvement across the board. Not only gray and ductile iron castings, but steel castings are now moving well as the capital goods markets warm up.

The problem that plagues a lot of castings producers is the difficulty of planning for the second quarter. Buyers are unwilling to order ahead, even in the nonferrous castings where metal supplies have been tighter.

Buyers have enjoyed a lot of excess foundry capacity during 1983, which allowed for fast delivery, even though some suppliers to the auto and appliance industry were up to full capacity.

With a reviving farm equipment and construction machinery market, two big outlets for gray and ductile castings, there's going to be an increase in delivery pressure from these buyers even though they've been unwilling to make long-term commitments. Another area of market growth: the energy-and-drilling market is showing more life, and producing some new castings demand.

There's also still a net return problem in foundries, faced with higher raw material costs and some decline in available scrap supply.

FORGINGS—The forging industry, which has been having more than its share of reverses in the past three years, finally got some good news.

January 1984 orders for the custom impression die forging producers surpassed $227 million, the highest monthly total since August 1981. In the nadir of the recesssion in 1982, some of the quarterly order figures were not much higher than the January 1984 monthly total.

Anchored by a record-breaking January, first quarter orders and shipments are substantially higher than fourth quarter 1983 totals. The second quarter will be even better, building upon first quarter gains.

The recent pickup in orders has been the result of a number of small factors and one major factor—the healthy automotive and truck industry.

"Car and truck orders are doing nicely," said an industry official. "Some shops are operating flat out, something we have not seen in a while."

As for the smaller factors: There is some evidence of recovery in the oil field. The past several months have seen some increases in oil drilling, which means a need for forgings.

The construction equipment industry is also on the rebound. The industry, which declined substantially in 1983, expects its sales volume in actual dollars will rise about 10 pct in 1984.

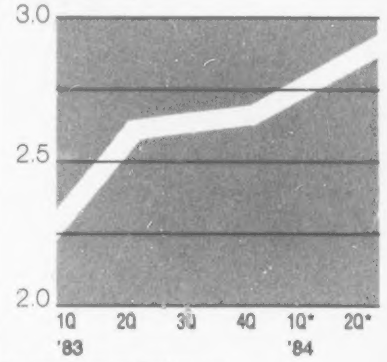
Aerospace industries, the biggest purchasers of forgings, are showing some life. However, much of this activity is military business. The financial plight of many airlines will continue to be reflected in the declining orders for large transport aircraft in 1984.

For the longer term, however, the forging industry is cheering a recent order by American Airlines for 67 MD-80 aircraft for delivery from 1985 through 1987. This order will probably spark orders from other airlines seeking to remain competitive with American.

Ferrous castings are showing improvement across the board.

Ferrous Castings, Shipments

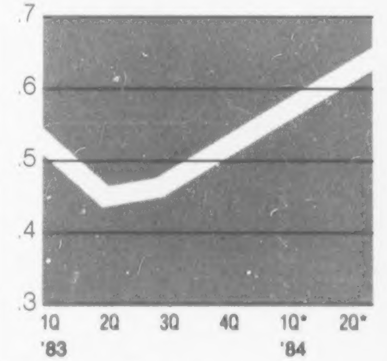
Millions of Tons



Source: Dept. of Commerce, Iron Castings Society
*IA estimate

Impression Die Forgings, Shipments

Billions of Dollars



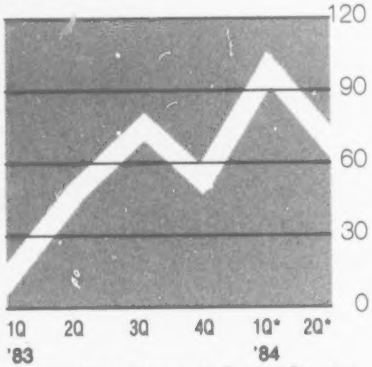
Source: Forging Industry Assn.
*IA estimate

AIRCRAFT, ENGINES & TURBINES

. . . a sustained period of airline profitability is required for . . . new orders.

Commercial Airplane, Orders

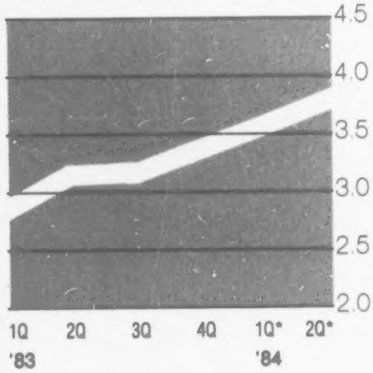
No. of Planes



Source: Airbus, Boeing, McDonnell-Douglas
*IA estimate

Engines and Turbines, Shipments

Billions of Dollars



Source: Dept. of Commerce
*IA estimate

AIRCRAFT—Buoyed by the largest domestic commercial airline order in recent memory and improving passenger traffic that could result in renewed profitability for major airline companies, major airframe manufacturers are beginning to talk optimistically about improved profits in 1984.

Economy recovery for the manufacturers has generally lagged behind other economic sectors and the major companies have been relying on military orders to help the long-depressed profit picture. But a major sign that this tide could be changing occurred in late February when American Airlines announced a $1.3 billion order for 67 new fuel efficient airplanes from McDonnell Douglas Corp. The airline citing the need to replace older, less efficient planes on short and medium routes, took options on 100 more of the craft.

Analysts and industry officials long have predicted that major domestic and foreign carriers were prepared to purchase new generation aircraft. But the American announcement suggested the economic recovery now has reached the point where the carriers are positioned to begin making those long-delayed purchases. There are expectations that other airline companies—or a consortium of firms—could announce similar purchases in the second and third quarters. This could place the airframe manufacturers in their strongest position since 1981.

But the short-term outlook for the second quarter remains guarded. There is no guarantee that orders actually will materialize by June. One industry official says that further domestic airline passenger growth is expected for 1984. The general economic recovery coupled with the resumption of traffic growth and improvements in airline profits should lead to new orders.

However, the same official warns that a sustained period of airline growth and profitability is required for substantial increases in new orders.

ENGINES & TURBINES—The slow but noticeable improvement that began in this industry during the latter half of 1983 is continuing.

But few industry officials are predicting any dramatic changes in shipments of engines and turbines for the second quarter.

Most agree manufacturers are seeing a steady upturn and that the low point has been reached.

But a sustained recovery is still a few months away as the industry lags behind other, more responsive segments of the economy.

The market for diesel engines appears to be the industry brightest hope at this time. A spokesman for one major manufacturer said that market has begun to show some new life and should see more gains in orders if the recovery stays on track.

The depressed state of the domestic nuclear energy industry; the drop in consumer demand for power which translates into a lack of new orders in the power plant market; and a continuing over capacity all are factors cited as a serious drag on this wide-ranging industry.

"We're slowly eating into the backlog of earlier industry orders, but we still have a way to go," explained one official.

He expects the year as a whole to be better than the previous year, but does not foresee any dramatic changes in production on a quarterly basis.

Most officials also cite the long lag time between the general economic recovery and its impact on major customers, like utility companies, to which many of the engines and turbines eventually are shipped.

Despite the conservatism, this industry appears to be more optimistic than it was at this time a year ago. The ongoing recovery is being viewed as a strong positive factor, although its full influence probably won't be felt for at least another few quarters.

WELDING, HEAT TREATING

WELDING—As a whole, the welding industry is showing signs of coming out of the doldrums, a position it has occupied for about two years now. The large fabricators are still suffering, but business in general is definitely picking up. There are some signs, however, that plate fabrication could come back to life in the second quarter.

One barometer of business is the welding supply index compiled by the National Welding Supply Assn. (NWSA), Philadelphia. The index for the fourth quarter 1983 reached 449 which surpassed the index figure of 382 for the fourth quarter 1983. The first quarter 1984 should come out at 500 and is expected to move on up to 550 in the second quarter.

One good reason that the American welding industry is as strong as it is can be traced to the fact that foreign competition is not much of a factor, at least in the standard products.

"January was a big month for business activity," said one welding distributor from the Southeast who is a member of the NWSA. "Inquiries and purchases are definitely on the upswing. Barring an unexpected turn for the worse, we anticipate the first quarter purchases to register bigger advances than those which were recorded in the final quarters of 1983."

A distributor from the Northeast states: "The improvement in customer optimism has accelerated over the past several months and we are seeing increases that cut across every segment of our business."

Distributors in the Midwest also are optimistic. One remarks that the resurgence of industrial activity represents a turnaround that will sustain a healthy rate of growth. "I look for a good year," he noted.

"Inquiries for capital equipment have definitely picked up," said another distributor in the East, "and interest rates will be a key factor influencing growth here."

HEAT TREATING—Heat treating, despite the strength it began to show in latter 1983, could be the industry to watch in 1984. The current forecasts from heat treaters are conservative. They expect a 10 pct to 15 pct gain in the first quarter over the closing period of 1983. In the second quarter, they don't expect much further upswing.

There's nothing wrong with the further increases against last year, which are higher than 20 pct on the basis of data available so far. But some companies are having to push their short term forecasts upward. Asked why, they're apt to say that the buying is on such short delivery that it's not producing much of a growth in backlog despite the continuing gains in volume.

Usually, the second quarter runs at about the pace set in the first quarter. It would be no surprise if it held at the same quarterly rate, or about $100 million in billings. But there are hints there may be more heat in the second quarter than those backlogs indicate.

Heat treaters appear to be doing some hedging against the possibility of a slug business in the second quarter. Orders for industrial heating equipment began to turn in the third quarter 1983 and have been gaining ever since. On the current projection, they could advance another 15 pct in the first quarter when final figures are in for the period. That's about double the average gain of the past five years. Equipment orders also are outpacing heat treating billings, when you compare them with the year ago period and were already doing that in the fourth quarter.

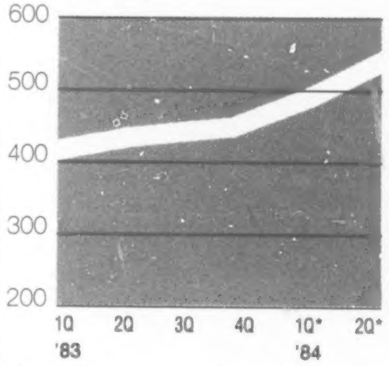
So heat treat planners have to cope with an old problem: That orders always lag on the uptake during an economic recovery, and then show up in a big slug that taxes capacity about three to six months later.

For heat treaters in 1984: An encouraging year is shaping up and perhaps a lot better than many have been willing to admit.

'. . . we are seeing increases that cut across every segment of our business.'

Welding, Shipments

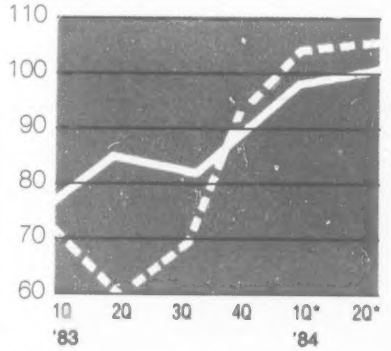
Index: 100 = $200 million in distributor sales



Source: National Welding Supply Assn.
*IA estimate

Heat Treatment

Millions of Dollars



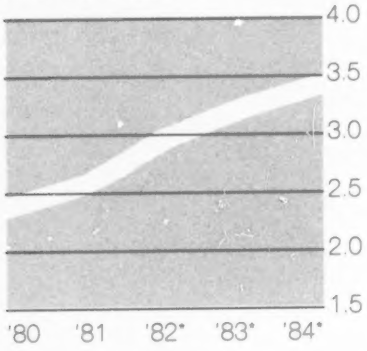
Source: Industrial Heating Equipment Assn., Metal Treating Institute
*IA estimate

▬ Sales of Commercial Heat Treaters
▬ ▬ ▬ Heat Processing Equipment Orders

SCREW MACHINE PRODUCTS, FASTENERS

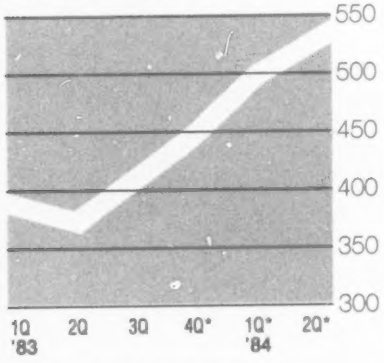
The recovery of the automotive industry . . . bodes well for the screw machine products industry.

Screw Machine Products, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Fasteners, Sales
Millions of Dollars



Source: Industrial Fasteners Institute
*IA estimate

SCREW MACHINE PRODUCTS—Recovery for the screw machine products industry began in the last half of 1983 and has carried into 1984. Preliminary figures indicate a strong spurt in screw machine product sales through the first quarter of 1984.

The increased business should continue into the second quarter. During 1983, discounting inflation, industry shipments grew 4 pct. For 1984, experts are predicting a 8.5 pct increase in shipments. However, that number could be low, if the high sales volumes of the first quarter persist.

The same factors that buoyed the the screw machine product industry in 1983 will continue to support the industry in 1984. Since about one-third of all industry shipments go the automobile-related businesses, the recovery of the automotive industry in 1983 and its predicted continuing growth in 1984 bodes well for the screw machine products industry this year. In 1983, nearly 20 pct more automobiles were produced in the U.S. than in 1982. In 1984, that growth curve should flatten out to an strong 12 pct.

Screw machine product sales to the appliance industry were another bright spot in 1983 and should continue to be strong through 1984, although the 20 pct growth in that industry in 1983 will taper off to a 5 pct to 12 pct increase for 1984. As plants begin to spend more money on machine tools and other machinery in 1984, and as the construction and farm equipment industries begin to revive, screw machine product sales should further improve.

Not all markets for screw machine products are improving, however. The aircraft industry, for example, will remain stagnant through much of 1984.

The major concern by the screw machine products industry is the threat of high interest rates. Solid growth in 1984 is predicated on the fact that interest rates show little upward movement.

FASTENERS—The turnaround in the mechanical fastener industry is obvious enough. Business is up 12 pct or more in almost all types of nuts and bolts. "It's really surprising how strong this recovery is," said one manufacturer.

Much of the industry's increased activity is clearly due to the boom in Detroit and in appliances. But, if this recovery does turn out to be traditional, after the consumer is done, capital goods will fall right behind. "That's what everyone hopes," adds one specials maker. What others fear is another matter. Right now it's flat out for a lot of fastener plants.

While the first quarter may be up 12 pct or more from the first quarter of 1983, the second quarter of this year may be significantly better. Some industry sources expect the total for the first half to be extremely good, even terrific. "The auto business is the big good news for us," said one.

'Our business is better today than it has been in years," said another industry executive. "We expect it to stay that way for at least the next three months."

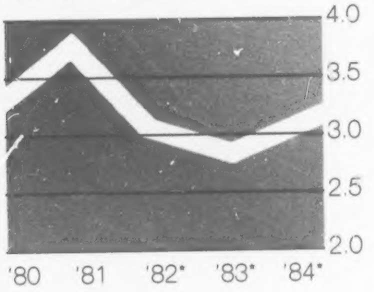
Meanwhile, the import cloud hangs over the industry like a permanent shroud. Much of the standards end of the business, in fact most, has been lost to Pacific Basin economies over the past decade. And, while the present upturn has brought better times to many companies in the industry here, there is little hope that foreign product will not continue to erode U.S. companies' domestic market share. That "little hope" has to do with quality, reports one industry expert. "There is some question in my mind," he said, "about how long the foreigners can keep the business they captured here, both in terms of industry and the consumer, due to their generally lower quality product."

Further hope comes from new labeling requirements on foreign products, making it difficult to pass off imported fasteners as domestic.

BEARINGS, STAMPINGS

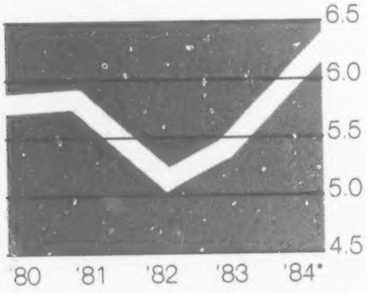
The bearing industry serves a number of markets which are slow to respond. . . .

Ball and Roller Bearings Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Stampings, Shipments
Millions of Dollars



Based on the average of a control group whose shipments total more than $500 million annually.
Source: American Metal Stamping Assn.
*IA estimate

BEARINGS—While 1983 was a tale of woe for the ball and roller bearing industry, industry experts expect a turnaround in 1984. Preliminary first quarter reports indicate sales are up from the year earlier levels.

In 1983, bearing industry shipments declined despite the recovery of automobile production and sales, the industry's largest market (about 30 pct of total bearing sales).

However, even an expanding auto industry was not enough to bring 1983 bearing sales into the black. Declines in major markets such as oil field equipment, machine tools, aircraft, railroad and farm and construction equipment crippled bearing sales for a second straight year.

This year will be another story. The bearing industry serves a number of markets which are slow to respond to recovery efforts. Some of these are showing signs of life.

The final quarter of 1983 and the first quarter of 1984 witnessed a number of rejuvenations. The construction industry, for example, after a bad first half, picked up in the fourth quarter. That growth is continuing through the first quarter of 1984. Some industry observers believe that the construction industry will see 5 pct real growth in shipments this year compared to an 8.7 pct decline in 1983.

Judging from first quarter figures, farm equipment also is beginning its modest recovery after two bad years. That industry is expected to achieve 5 pct real growth in 1984. Machine tool and machinery sales are reviving, too.

All is not rosy for the bearing industry, however. Aircraft production remains depressed and bearing imports continue to cut into sales efforts of U.S. manufacturers.

Second quarter sales should build on the advances made in the last months of 1983 and the first quarter of 1984. Spring growth will be steady but not spectacular.

STAMPINGS—In talking with stamping industry officials about their prognoses for the second quarter, one producer was almost tempted to ask, "Hey, where's the beef?"

Indeed, although they share everyone's concern over the Federal deficit's impact on interest rates and constricted money supply, stampers' "beefs" seemed rather rare.

One Midwest stamper summed it up this way: "Things are great. Our schedules are much better and after three years of having our ears knocked off, we're just sittin' back and paying off old bills."

Because of the cyclical nature of the industry, he said he couldn't forecast the length of this euphoria. Nevertheless, he expects market demand to remain at this level through June.

Consumer sales are mainly responsible for this headiness, as car sales continue on a roll and February's housing starts rose 20 pct above the January level to their highest point in four or five years.

The industry is also riding the crest of the computer and office equipment sales, but stampers expressed concern for farm equipment sales.

As one put it, " All I read about are farm foreclosures."

Shipments of contract metal stampings hit an all-time high in January, up 3 pct from December 1983 and 39 pct above the January 1983 level. Orders booked in January were 1 pct ahead of the December 1983 range and 27 pct above the January 1983 figure.

Meanwhile, the industry backlog inched up to new heights in the first quarter of 1984, reaching 2 pct above the December 1983 point and 25 pct higher than the year-ago figure.

Said another industry spokesman, "Another optimistic factor is the strength of the backlog, as indicated by expected dates of shipment. Delivery pressures are definitely increasing. It's been a long time since the outlook has

GEARS, VALVES

GEARS—The current economic rebound, one gearmaker predicted, "won't be a zinger—just a slow, steady climb."

Last year, was a year that gear makers painfully endured. Orders were low and there wasn't much action in the marketplace. Conditions in the early months of this year seem to be improving. As one source put it, the first quarter of this year was about 15 pct better than the last quarter of 1983. And, he predicted, the second quarter will be up 10 pct over the first quarter.

According to an American Gear Manufacturers Assn. (AGMA) report, its bookings index ran 12 pct higher in January 1984 than in the previous month and 46 pct higher than January a year ago.

Lead times are short and probably will remain so the next few months.

"There still is not much project work going on," lamented a Midwestern gear

Gear markets, including paper/pulp and cement are active. Other industries, such as steel and transportation are either in the doldrums or static.

"Most of our customers are caught in a cash crunch," one explained.

One industry member foresees a pickup in sales of gears to the aluminum industry and a possible rebound in the offshore services market.

Some gear manufacturers are cashing in on automotive and construction predictions of a 20 pct gain in 1984.

One company, Cummins Engine Co. reported that higher demand for heavy-duty trucks prompted it to boost its production of diesel engines an extra 15 pct in the first quarter of this year.

One issue that has a number of gear makers worried is, President Reagan's recent willingness to pare the defense budget by $40 billion. This development could take some wind out of the gear industry's sales in 1984.

Summing up the outlook into the second half, one spokesman put it: "Sure, it's trickling down to us, but we're talking about a pool, not a lake."

VALVES—"We couldn't go much lower," sighed a Midwest valve manufacturer, relieved that the economy's new momentum has finally reached his industry.

Traditionally, because the valve business lags the general economy by nine to 12 months, last year's pickup is has finally had its impact.

'We're catching up, we're getting synchronized. I expect our second quarter to be better than the first, the third better than the second and the fourth best of all," said one valvemaker. He believes the industry sales will rise between 4 and 8 pct this year.

For 1984, industry shipments of valves and pipe fittings are expected to rise about 6 pct in constant dollars, lower than the projected 8.5 pct increase in fabricated metal products, but higher than the 5.2 pct increase predicted for the economy's GNP.

End-user demand for control valves and actuators is particularly heavy from chemical process industries and power generating plants. This demand will continue to push valve sales. Residential construction also has boosted valve component sales.

There's little doing at nuclear power facilities but, as one spokesman put it, "there's positive movement in offshore drilling." He forecasts a bright, long-term outlook after record lease applications in 1983, although he wouldn't go so far as to term this a "boom" market.

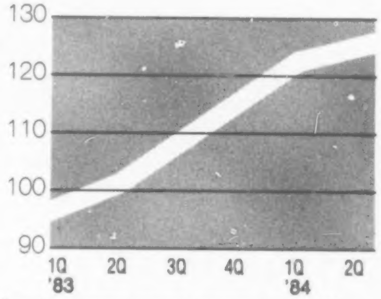
Meanwhile, industry inventories are down and adjusted and lead times, are holding at first quarter levels.

A recent report from the Valve Manufacturers Assn. (VMA) indicated that a major 1984 priority is the world market and how to control the results of change, prompted by economic and competitive pressures.

As one valve maker said, "Our markets haven't made us want to jump up and down and dance in the streets, but compared to last year we're in a much more positive position."

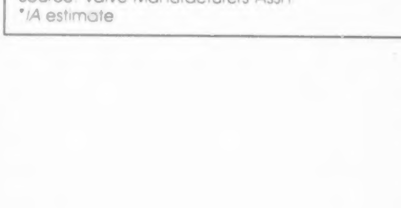
Lead times are short and probably should remain so for the next few months.

Gears, Bookings



Based on average monthly bookings, 1977=100
Source: American Gear Manufacturers Assn
*IA estimate

Valves, Shipments
Billions of Dollars

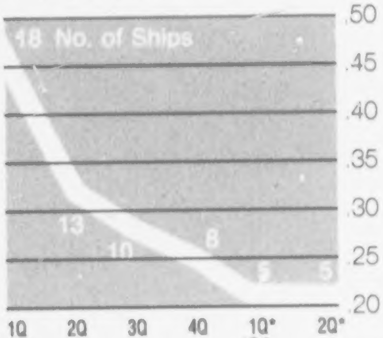


Source: Valve Manufacturers Assn
*IA estimate

SHIPBUILDING, RAILCARS

. . . employment in some shipyards . . . will never reach the peak it achieved in 1977.

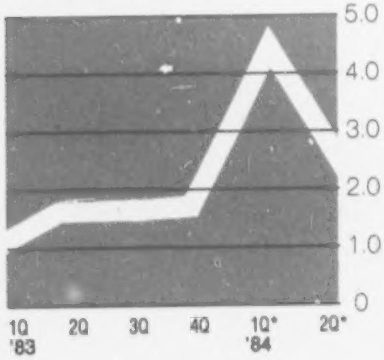
Shipbuilding
Millions of Gross Tons



Commercial ships on order or under construction, 1,000 gross tons or over

Source: Maritime Administration
*IA estimate

Rail Car Orders
Thousands of Units



Source: American Railway Car Institute
*IA estimate

SHIPBUILDING—The good news is that the American shipping lines are buying freighters and tankers. Unfortunately, they are not buying them from American shipyards. All the business is going to Japan, South Korea and Taiwan.

"If it weren't for the U.S. Navy," comments one observer, "we probably wouldn't have any shipyards at all."

Eight commercial ships were under construction in U.S. yards at the end of last year. Now, that production number has been reduced to five.

During the first quarter of 1983, 18 commercial ships were being constructed. By the end of this year, the figure will probably be reduced to one. As far as commercial shipbuilding is concerned, an industry spokesman said that the industry is at its lowest ebb since 1935. Ship repair work is even in a sluggish state.

A few years ago, U.S. shipyards were building 70 offshore rigs per year. The number of rigs under construction is now down to three or four.

Fortunately, not all is gloom and doom because a number of shipyards in this country are working on 111 vessels for the Navy. A year ago, the yards were only building 105 vessels.

The busy shipyards, of course, are the ones with Navy contracts, but even in these yards employment is at its lowest ever. The feeling is that employment in some shipyards will slowly starting building up again toward the end of the third quarter, but will never reach the peak it achieved in 1977.

Several yards are anxiously awaiting news of the contract award for 60 new destroyers from the Navy. The contract is expected to be awarded toward the end of this year.

According to one source, the offshore business has evaporated for the time being, but it's expected to return eventually. When? No one knows.

So, for commercial shipbuilding, the second quarter will be no better than the first quarter—disastrous.

RAILCARS—The builders of railroad cars will never forget those booming times when industry used to field orders for 100,000 cars per year. It's almost impossible to understand how production dropped the way it did, all the way down to 6,000 railroad cars in 1983.

And, when you think of it, a year when orders for cars totaled 40,000 used to be considered as a bad year.

Then along came January 1984. In that one month alone, orders soared to 2,736 units. It was the biggest order month since December 1980 when 4,722 cars were ordered. According to one industrial authority, this recent boom in business has been nicely spread out among the five builders.

As good as it sounds, January is not the beginning of another 100,000-car year, even though the first quarter as a whole (4,600 cars) is a vast improvement over the fourth quarter of 1983, when 1,798 cars were ordered. The next quarter should result in orders for 2,900 cars, but the balance of the year may not keep up the pace.

The problem is a surplus of cars, most of which were delivered prior to deregulation in 1982.

Even the predictions for an improved year in coal shipments will not turn the industry around. There are thousands of coal cars "sitting idle."

In comparison to 1983, this year, quarter for quarter, will be a slight improvement overall.

U.S. carbuilders delivered 415 new cars in January, compared to 440 new cars in January 1983. According to the American Railway Car Institute, 745 were delivered this past December.

The figures are much more optimistic for freight cars on order and undelivered. Cars on order totaled 5,650 on Feb. 1, whereas only 3,271 cars were on order on Jan. 1. □

Reprints available while supply lasts. For single copy, circle No. 85 on Inquiry Card. Additional copies, $1 for articles up to eight pages. Longer articles $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write: IRON AGE, Reader Service, Chilton Way, Radnor, PA 19089. Ask for Reprint No. 4492

PRICE & PRODUCTION DATA

(Effective March 26, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	251	252	241	198
Buffalo	11	11	11	32
Pittsburgh	296	314	293	209
Youngstown	110	127	126	93
Cleveland	139	135	145	132
Detroit	172	168	151	145
Chicago	561	539	577	464
Cincinnati	106	106	106	102
St. Louis	85	83	85	67
Southern	234	235	221	135
Western	85	82	81	74
U.S. Production	2,050	2,052	2,037	1,651

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective March 26, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,050	2,052	23,001	16,754
Capability Utilization Rate	79.3	79.4	74.2	48.2

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.939	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 90.83	$ 90.83	$ 94.17	$ 72.83
No. 2 bundles	$ 61.83	$ 62.17	$ 63.17	$ 51.83

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$100.50	$100.50	$102.50	$ 77.50
No. 1 steel, Philadelphia	84.50	84.50	89.50	63.50
No. 1 steel, Chicago	87.50	87.50	90.50	77.50
No. 1 bundles, Detroit	95.50	95.50	98.50	76.50
Low Phos., Youngstown	96.50	99.50	100.50	69.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	79.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	111.50	111.50	111.50	112.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective March 26, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	74.00	72.00-74.00	3/20/84
Lead	25.00-28.00	24.00-28.00	3/7/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	53.00	51.00-53.00	3/12/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.50
Calcium, ton lots, crown	$3.50
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$387.40
Indium, dollars per troy oz.	$2.50
Iridium, dollars per troy oz	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$300-$310
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz	$9.345
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

March 19—576.23
March 20—575.70
March 21—575.70
March 22—575.44
March 23—577.02

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	68	59
Yellow brass	62½	57
Red brass	64¼	57¾
Comm. bronze	65	58
Mang. bronze	64¾	57
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb.,.carload lots, del. refinery)

No. 1 copper wire	65
No. 2 copper wire	55
Light copper	46

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	61
No. 2 copper wire	51
Light copper	42
No. 1 composition	58
No. 1 comp. turnings	56
Hvy. yellow brass solids	39
Hvy. yellow brass turnings	34
Radiators	48

Aluminum

New mixed clips	51	—52
Old sheet	50	—51
Old cast	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	45	—47
Mixed L.C. clips	39	—41
Old sheets and cast	37	—38
Borings and turnings	28	—29
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	53	—54
No. 2 copper wire	44	—45
Light copper	38	—39
Radiators	36	—37
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	47	—48

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE MAR. 26, 1984

(Effective March 26, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to $101.00
No. 2 hvy. melting	90.00 to 91.00
No. 1 dealer bundles	119.00 to 120.00
No. 1 factory bundles (auto)	125.00 to 126.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	112.00 to 113.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	54.00 to 55.00
Cast iron borings	53.00 to 54.00
Low phos. punchings plate	125.00 to 126.00
Heavy turnings	90.00 to 91.00
No. 1 RR hvy. melting	113.00 to 114.00
Rails 2 ft. and under	122.00 to 123.00
Scrap rails, random lgth.	107.00 to 108.00
RR specialties	121.00 to 122.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	590.00 to 600.00
18-8 turnings	490.00 to 500.00

Chicago

No. 1 hvy. melting	$ 87.00 to $ 88.00
No. 2 hvy. melting	81.00 to 82.00
No. 1 dealer bundles	112.00 to 113.00
No. 1 factory bundles (auto)	115.00 to 116.00
No. 2 dealer bundles	64.00 to 65.00
No. 1 busheling	107.00 to 108.00
Shredder scrap	106.00 to 107.00
Machine shop turn.	46.00 to 47.00
Mixed bor. and turn.	47.00 to 48.00
Shoveling turnings	58.00 to 59.00
Cast iron borings	58.00 to 59.00
Low phos. forge crop	122.00 to 123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to 133.00
Low phos. 2 ft. and under	127.00 to 128.00
No. 1 RR hvy. melting	109.00 to 110.00
Scrap rails, random lgth.	99.00 to 100.00
Reroller rails	112.00 to 113.00
Rails, 2 ft. and under	126.00 to 127.00
RR couplers and knuckles	110.00 to 111.00
RR car axles	134.00 to 135.00
No. 1 machinery cast	111.00 to 112.00
Cupola cast	105.00 to 106.00
Stove plate	106.00 to 107.00
Steel car wheels	117.00 to 118.00
Stainless	
18-8 bundles and solids	550.00 to 560.00
18-8 turnings	450.00 to 460.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 83.00 to $ 86.00
No. 2 hvy. melting	73.00 to 76.00
No. 1 dealer bundles	101.00 to 104.00
No. 2 dealer bundles	60.00 to 63.00
No. 1 busheling	101.00 to 104.00
Shredder scrap	95.00 to 98.00
Machine shop turn.	29.00 to 32.00
Mixed bor. and turn.	29.00 to 32.00
Shoveling turnings	47.00 to 50.00
Low phos. 5 ft. and under	97.00 to 100.00
Low phos. 2 ft. punchings	117.00 to 120.00
Electric furnace bundles	116.00 to 119.00
RR specialties	98.00 to 102.00
Rails, 2 ft. and under	115.00 to 118.00
Cupola cast	70.00 to 73.00
Heavy breakable cast	57.00 to 60.00
No. 1 machinery cast	99.00 to 102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to $ 69.00
No. 2 hvy. melting	65.00 to 66.00
No. 1 dealer bundles	95.00 to 96.00
No. 2 bundles	46.00 to 47.00
No. 1 busheling	94.00 to 95.00
Drop forge flashings	66.00 to 67.00
Machine shop turn.	46.00 to 47.00
Mixed borings and turn.	29.00 to 30.00
Shoveling turnings	47.00 to 48.00
Cast iron borings	49.00 to 50.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	460.00 to 470.00
18-8 turnings	360.00 to 370.00
430 bundles and solids	120.00 to 130.00

Youngstown

No. 1 hvy. melting	$ 85.00 to $ 88.00
No. 2 hvy. melting	67.00 to 70.00
No. 1 dealer bundles	100.00 to 103.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	95.00 to 98.00
Electric furnace bundles	91.00 to 94.00
Galvanized bundles	86.00 to 89.00

Cleveland

No. 1 hvy. melting	$ 80.00 to $ 83.00
No. 2 hvy. melting	50.00 to 53.00
No. 1 dealer bundles	97.00 to 100.00
No. 1 factory bundles	102.00 to 105.00
No. 2 bundles	30.00 to 33.00
No. 1 busheling	99.00 to 102.00
Machine shop turn.	13.00 to 16.00
Mixed bor. and turn.	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	122.00 to 125.00
Low phos. punchings plate	122.00 to 125.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	127.00 to 130.00
Rails, 18 in. and under	128.00 to 131.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	107.00 to 110.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00 to $ 75.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 busheling	89.00 to 90.00
No. 1 dealer bundles	89.00 to 90.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	25.00 to 26.00
Low phos. plate	102.00 to 103.00
Structural and plate, 2 ft. and under	102.00 to 103.00
Rails, 2 ft. and under	97.00 to 98.00
Scrap rails, random lgth.	77.00 to 78.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 82.00 to $ 83.00
No. 2 hvy. melting	72.00 to 73.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	70.00 to 71.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	40.00 to 41.00
No. 1 RR hvy. melting	89.00 to 90.00
Rails, random length	87.00 to 88.00
Rails, 18 in. and under	99.00 to 100.00
RR specialties	97.00 to 98.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	88.00 to 89.00
Cast iron car wheels	57.00 to 58.00
Rerolling rails	94.00 to 95.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 77.00 to $ 78.00
No. 2 heavy melting	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	57.00 to 58.00
No. 1 busheling	82.00 to 83.00
Shredder scrap	107.00 to 108.00
Machine shop. turn.	41.00 to 42.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	50.00 to 51.00
Electric furnace bundles	75.00 to 76.00
Elec. furnace, 3 ft. & under	80.00 to 81.00
Structural and plate, 2 ft.	108.00 to 109.00
Structural and plate, 4 ft.	105.00 to 106.00
No. 1 RR hvy. melting	105.00 to 106.00
Scrap rails, random lgth.	95.00 to 96.00
Rails, 18 in. and under	110.00 to 111.00
Angles and splice bars	105.00 to 106.00
No. 1 cupola cast	94.00 to 95.00
Unstripped motor blocks	74.00 to 75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to $ 72.00
No. 2 hvy. melting	65.00 to 66.00
No. 1 dealer bundles	85.00 to 86.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	29.00 to 30.00
Low phos. 18 in. and under	103.00 to 104.00
Rails, random length	84.00 to 85.00
Rails, 2 ft. and under	99.00 to 100.00
No. 1 cupola cast	74.00 to 75.00
Heavy breakable cast	38.00 to 39.00
Drop broken cast	90.00 to 91.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 49.00 to $ 51.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	500.00 to 520.00
18-8 turnings	400.00 to 420.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to $ 72.00
No. 2 hvy. melting	60.00 to 62.00
No. 1 dealer bundles	75.00 to 77.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	78.00 to 80.00
Shredder scrap	75.00 to 77.00
Machine shop turn.	14.00 to 16.00
Shoveling turnings	20.00 to 22.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	20.00 to 22.00

San Francisco

No. 1 hvy. melting	$ 48.00 to $ 50.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	37.00 to 39.00
No. 2 dealer bundles	19.00 to 21.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 52.00 to $ 54.00
No. 2 hvy. melting	42.00 to 44.00
No. 1 dealer bundles	41.00 to 43.00
No. 2 dealer bundles	21.00 to 23.00
Machine shop turn.	12.00 to 14.00
Shoveling turnings	10.00 to 12.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 73.00 to $ 75.00
No. 2 hvy. melting	62.00 to 64.00
No. 2 bundles	44.00 to 46.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 85.00 to $ 86.00
No. 2 hvy. melting	69.00 to 70.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	20.00 to 21.00
Crushed turnings	45.00 to 46.00
Shredder scrap	85.00 to 86.00
Cut structural plate 2 ft. and under	100.00 to 102.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	81.00 to 82.00

PRODUCER KEY
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N8	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P13	Penn Dixie Steel Corp., Kokomo, Ind.
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	24.53	31.04	32.34	31.38	22.52	23.47	18.45	31.36	34.34	50.60	69.58	73.19
Baltimore	25.93	30.44	37.14	40.13	28.41	28.12	21.23	38.10	56.93	64.90	71.71	75.93
Birmingham	22.56	31.52	31.90	31.14	22.81	24.48	18.86	30.94	49.31	58.90	68.10	74.43
Boston	30.49	35.06	39.28	44.29	33.34	30.06	21.57	36.76	47.00	56.74	63.46	65.60
Buffalo	28.00	34.53	39.69	41.00	31.32	27.57	18.89	37.20	40.10	47.82	55.33	60.11
Chicago	28.43	33.82	37.13	37.69	23.82	23.96	17.50	31.99	36.06	40.45	45.47	51.06
Cincinnati	26.66	33.07	35.98	30.18	23.56	23.84	17.39	31.73	36.03	40.33	45.56	50.75
Cleveland	27.52	32.48	35.61	35.12	26.10	25.91	18.19	22.87	36.30	40.98	44.14	50.71
Denver	33.76	39.26	39.92	37.00	32.23	28.47	20.80	45.41	49.83	60.27	68.31	75.60
Detroit	27.48	33.83	36.92	33.00	25.61	27.17	17.46	32.00	36.14	40.44	45.84	54.26
Houston	30.18	34.80	39.22	41.62	28.89	27.66	22.92	42.20	48.22	55.77	61.13	66.06
Kansas City	28.55	34.01	38.32	44.62	25.39	27.53	18.90	34.04	42.11	46.17	52.71	61.93
Los Angeles	27.47	34.10	37.84	42.53	32.64	33.40	28.66	39.81	55.94	63.94	69.61	74.65
Memphis	25.34	33.06	34.52	33.57	25.93	28.17	20.00	34.00	36.78	49.96	59.80	69.44
Milwaukee	28.32	34.20	36.76	31.78	23.76	23.25	16.92	31.29	35.66	41.29	45.12	53.21
New York	28.52	35.30	40.00	44.75	31.81	28.14	20.54	41.14	46.00	51.91	61.12	68.72
Philadelphia	29.01	34.06	39.94	42.10	32.13	28.53	20.11	39.09	46.31	54.81	65.15	70.83
Pittsburgh	31.28	37.37	40.62	31.22	34.34	29.53	20.76	31.80	46.10	53.06	60.27	68.22
Portland	28.96	32.06	38.73	36.93	31.42	34.78	27.87	44.85	49.78	57.74	70.44	. . . .
San Francisco	27.93	31.06	38.28	37.89	33.42	29.52	25.80	40.79	58.52	67.63	74.54	82.70
Seattle	23.94	33.41	35.11	34.23	22.24	27.32	24.89	40.73	53.67	70.51	74.14	80.87
Spokane	21.21	30.42	35.65	38.02	33.36	33.77	21.97	43.01	43.20	47.52	. . . .	58.32
St. Louis	27.64	33.26	35.74	33.69	25.60	23.20	17.86	33.59	38.01	42.74	50.17	53.66
St. Paul	27.15	31.20	34.74	36.69	25.85	24.27	17.70	33.75	36.49	41.49	46.09	52.40

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 80. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6.	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, P3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3 I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	22.45
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2. W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢

**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7, I4	23.95
U1, I3, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	26.10
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRODUCER PRICES UP IN FEBRUARY

The economy continues to grow—maybe be too fast, some analysts say. There is fear of overheating.

Producer prices, however, rose at only a "moderate" rate in February, according to the Bureau of Labor Statistics (BLS). They give scant indication the economy is being fueled at an unhealthy rate, according to the statistics.

The producer price index for the second month of 1984, showed a 0.4 pct increase compared with 0.6 pct in January, the BLS said.

The January rise was the steepest in 14 months. So even though the rate of increase slowed in February, prices are running at a faster pace. Prices for crude materials other than food and energy rose 0.8 pct in February after declining 3.6 pct in January.

Prices for capital equipment rose 0.5 pct after edging up 0.1 pct in January, the BLS said. Within that category, prices rose for motor trucks, truck trailers and aircraft, among others. Car prices showed no increase while light trucks were up only 0.1 pct. Those increases offset declines for office and store machines, transformers and printing trades machinery.

Without food and energy factored in, industrial prices for February increased about the same as in each of the previous three months, 0.2 pct. The indexes for passenger cars and light vehicles showed large increases after seasonal adjustment.

The index of intermediate products, used in various stages of production, was unchanged in February after seasonal adjustment. That index has inched up 0.1 pct in previous months.

The durable manufacturing materials index advanced 0.5 pct. Higher prices were registered for most nonferrous metals, steel pipes and tubes.

In a related development, industrial production rose 1.2 pct in February compared with January, according to the Federal Reserve Board. It is the second strong increase in two months.

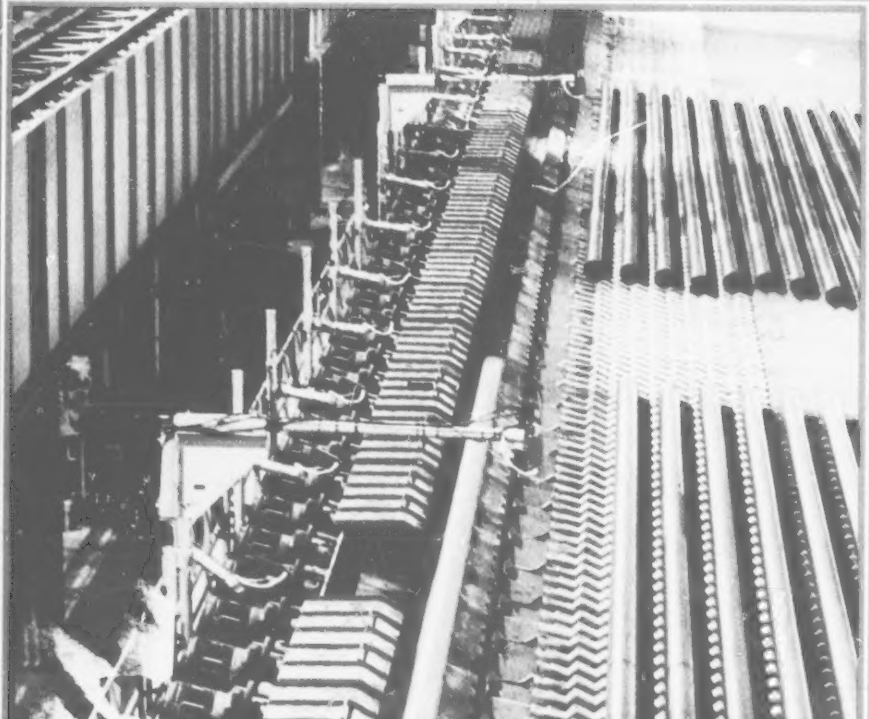
Latest Month Covered: February 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	383.9	+ 2.5	+ 1.3
Metal Forming Machine Tools	419.3	0	+ 1.3
Agricultural Machinery & Equip.	331.1	+ 0.1	+ 2.4
Construction Machinery & Equip.	355.9	+ 0.5	+ 1.9
Industrial Process Furnace & Ovens	370.6	+ 0.1	+ 3.8
Industrial Material Handling Equip.	287.2	+ 0.1	+ 0.8
Pumps, Compressors & Allied Equip.	346.3	+ 0.1	− 0.1
Fluid Power Equip. (Dec. 1970 = 100)	254.9	0	+ 1.1
Mechanical Power Transmission Equip.	321.7	0	+ 2.3
Automobiles	221.9	0	+ 2.5
Motor Trucks—Light	280.8	+ 0.1	+ 3.0
Motor Trucks—Heavy	326.9	+ 0.7	+ 3.0
Railroad Equipment	359.2	0	+ 2.5
Fabricated Metal Structural Products	306.9	+ 0.1	+ 1.4
Electric Motors	337.7	+ 0.1	+ 4.5
Valves & Fittings (Dec. 1982 = 100)	100.4	+ 0.2	− 0.4
Ball & Roller Bearings	335.5	0	+ 1.3
Cutting Tools & Accessories	276.9	+ 0.1	+ 1.5
Heating Equipment	248.4	+ 0.4	+ 3.2
Plumbing Fixtures & Brass Fittings	296.9	+ 1.0	+ 4.7
Metal Containers	344.9	+ 0.1	+ 4.2
Miscellaneous Metal Products	290.7	+ 0.3	+ 4.2

Data based on U.S. Labor Dept.'s Producer Price Index

CHILTON'S
IRONAGE
April 16, 1984

573/04-
C2150-2



IN PURSUIT OF NEW TECHNOLOGY IN STEEL

U.S. STEEL UNLEASHES ITS NEW SEAMLESS TUBE MILL

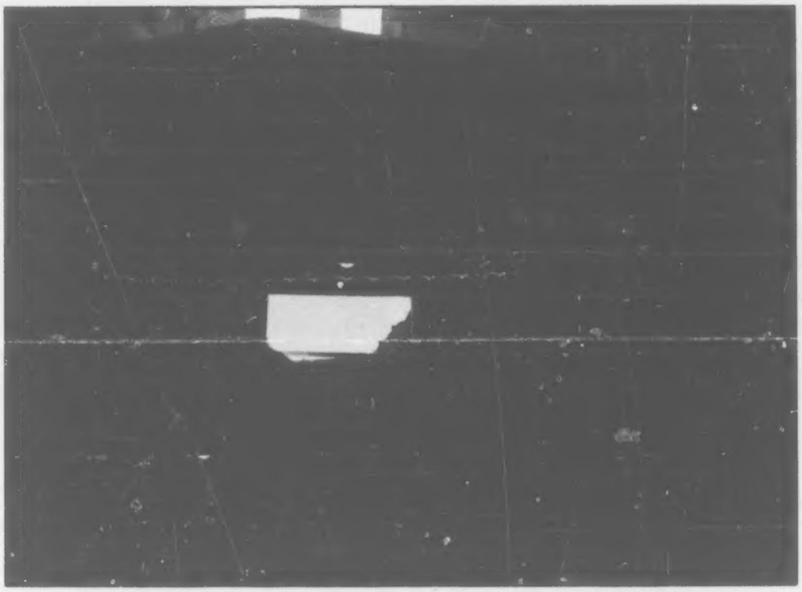
THE WORLD'S TOP 50 STEEL PRODUCERS

PLUS

THE HOT SPOT

APRIL 16, 1984 VOL. 227, NO. 8

CHILTON'S IRONAGE METALS PRODUCER



Cover: Photo courtesy of U.S. Steel. Above: Georgetown Texas Steel.

Editorial 7
Are we facing another Sputnik?

Newswatch 12
U.S. Customs bolsters inspection of steel imports.

The Hot Spot 40
Mexico: Roderick's charges are misleading.

You and Your Job 43
CEOs should identify and develop a corporate replacement.

World Steel 45
Steelmaking technology is surprisingly active.

Service Centers 56
More products, higher-value metals mark 1984 rebound.

Seamless Tube Technology 72
Two innovations in U.S. mills attract interest.

Specialty Steel 84
U.S. restrictions could spark a trade war.

Management Challenge 87
More top executives must champion quality control.

World's Top 50 Steel Producers 100
1983 analysis reveals some unexpected industry trends.

Materials Report 117
Steel supply rising; aluminum orders falling.

Order Trends 124
Capital spending led the gain in February.

Next Issue: Annual Steel/Nonferrous Financial Analysis.

Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 11
INDUSTRIAL BRIEFS 27
PERSONNEL TOUCH 108
PRODUCT & EQUIPMENT REVIEW 109
AD INDEX 114
MANAGEMENT SERVICE CARD 115
BUSINESS STAFF 116
P&P DATA 4/9 119
FERROUS SCRAP 4/9 121
CLEARING HOUSE 122

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

Chilton abc

IRON AGE's 1983
TOP 50
WORLD STEEL PRODUCERS

Our annual survey of the World's Top 50 Steel Producers reveals cutbacks in staff and plant are taking place worldwide, and that the U.S. steel producers are staging a serious, successful fight for survival.

BY JAMES B. POND

Analysis of the 1983 *Iron Age* Metals Producer survey of the World's Top 50 Steel Producers reveals some unexpected trends in the industry.

The present survey is an outgrowth of earlier studies conducted by *Iron Age Metalworking International* (IAMI) which for many years reported world steel production and financial data. Last year, the financial performance data was dropped due to widely fluctuating exchange rates, different fiscal years, and the growing number of multi-industry steel producers. Most firms complained that the results were neither fair nor neccessarily accurate.

In place of the financial-related questions, it was felt that the relative efficiency of plants located around the world, as measured by tons of steel produced per employee, would be a fair measure. And impartial.

The survey of 1983 steel production asked that only employees involved with steelmaking operations be reported. This should include administration, sales and production employees. The question and numbers reported are judgmental. They may not be comparable from one company to another. When clarification inquiries were made to us, we asked that all employees normally associated with steelmaking operations be included. This generally was satisfactory and understood.

If there is disagreement in the numbers reported for number of employees during 1982 as reported in our 1982 and 1983 surveys, the 1983 data is to be preferred because some of the previous reports included persons not engaged in steelmaking. This change has been particularly important to some of the larger firms that have operating divisions in such industries as shipbuilding, construction, off-shore structures, and bridge building.

Also clarified for 1983 was the definition of maximum capability or capacity. Some firms simply reported rated design capacity of their equipment and facilities. Does this imply one, two or three operating shifts per day? Some processes are continuous and run for days, weeks or months without letup. We agreed with one company that defined it as "The tonnage capability to produce raw steel for a sustained full order book."

New for the 1983 survey is the question: "How much steel production was exported, as a pct of your total shipments?" The industry's response to this question was rather revealing. Several of the steel producers export more than 90 pct of their production. And, not surprising, perhaps, the major U.S. producers exported essentially none of their output.

A review of the relative performance and change in percentages from 1982 to 1983 reflects orientation of the steel producers in various countries and markets. Many firms increased their export ratios during 1983 and many decreased exports.

Drawing Conclusions

What conclusions can we draw from the 1983 *Iron Age* Metals Producer survey?

In this world economic climate with its recent worldwide recession in both the metal producing and metalworking industries—a real disaster for both industries—it did not seem appropriate to hold a contest for the firm that increased its employment the most. The goal in the eyes of most financial people is to get rid of people to reduce overhead. Nevertheless, seven firms out of the 50 surveyed did increase employment during 1983. In first place was Sacilor, with an increase of 7,147. Armco Inc. of the U.S. was a surprising

PERFORMANCE ANALYSIS

1983 TOP TEN PRODUCERS

Based on Tons Produced Per Employee

	Ranking	Company	Country	1983	1982
1	(12)	Pohang	(S. Korea)	689.3	725.5
2	(16)	Kobe Steel	(Japan)	463.8	476.9
3	(32)	China Steel	(Taiwan)	451.6	374.9
4	(5)	NKK	(Japan)	450.4	465.1
5	(39)	Sidmar	(Belgium)	446.1	410.4
6	(1)	Nippon Steel	(Japan)	418.9	433.7
7	(6)	Kawasaki Steel	(Japan)	363.1	368.3
8	(7)	Sumitomo	(Japan)	359.2	368.0
9	(48)	Rautaruukki	(Finland)	293.5	298.8
10	(42)	Nisshin Steel	(Japan)	288.3	284.0

Firms That Shrank in 1983 By Decreasing Employment

Rank	Company	1982 → 1983	Change
1	British Steel (3)	103,700 → 81,100	22,600
2	U. S. Steel (2)	62,787 → 49,095	13,692
3	Broken Hill (19)	41,858 → 30,836	11,022
4	Bethlehem Steel (8)	43,545 → 35,052	8,493
5	Iscor (21)	50,538 → 43,615	6,923
6	Krupp Stahl (28)	35,840 → 29,075	6,000
7	Finsider (4)	99,700 → 94,100	5,600

Steel Producers That Improved Production in 1983

	Company	1982 → 1983 (metric tons)	Change (metric tons)
1	U. S. Steel (2)	10,988,000 → 13,440,000	2,452,000
2	Siderbrás (9)	7,700,000 → 9,100,000	1,400,000
3	British Steel (3)	11,400,000 → 12,700,000	1,300,000
4	COSIPA (37)	1,854,269 → 3,018,000	1,163,731
5	China Steel (32)	2,316,707 → 3,411,010	1,094,303
6	J & L (13)	5,896,000 → 6,985,000	1,089,000
7	Republic (18)	4,613,000 → 5,700,000	1,087,000
8	Inland (17)	4,691,028 → 5,720,677	1,029,649
9	Armco (20)	4,811,695 → 5,430,933	619,238
10	CSN (38)	2,301,000 → 2,864,000	563,000

Best Productivity Improvement 1983 Versus 1982 (Tons/Employee)

Rank	Company	Tons/Employee 1982 → 1983	Pct
1	COSIPA (37)	129.0 → 214.1	65.7
2	U. S. Steel (2)	175.0 → 273.7	56.4
3	British Steel (3)	109.9 → 156.6	42.5
4	Wheeling-Pittsburgh (46)	205.3 → 268.9	31.0
5	CSN (38)	100.9 → 131.0	29.8
6	J & L (13)	190.2 → 240.9	26.6
7	Bethlehem (8)	219.2 → 276.7	26.2
8	Inland Steel (17)	223.4 → 279.1	24.9
9	Krupp Stahl (28)	111.4 → 134.3	20.6
10	China Steel (32)	374.9 → 451.6	20.4

Firms That Grew in 1983 By Increasing Employment

Rank	Company	1982 → 1983	Change
1	Sacilor (14)	60,353 → 67,500	7,147
2	Armco (20)	18,634 → 21,596	2,962
3	Sidermep (31)	37,331 → 39,098	1,767
4	China Steel (32)	6,180 → 7,554	1,374
5	Tata Iron & Steel (47)	64,038 → 64,757	719
6	Pohang Iron & Steel (12)	12,103 → 12,241	138
7	Nisshin Steel (42)	8,846 → 8,965	119

CARPENTER

TOOL and DIE STEELS.

At the right place!
At the right time!

The right place—Your local Carpenter Service Center and distributor have newly expanded supplies of cold-work tool and die steels, at competitive prices.

The right time—Right now. We have ready availability to fill orders faster and start delivery sooner, on both large and small orders.

Make the right call. When you call Carpenter first, you don't waste time looking around. We have the tool and die steels to meet all of your requirements. We're listed in the Yellow Pages under "Steel Service Centers and Warehouses."

CARPENTER TECHNOLOGY
CARPENTER STEEL DIVISION

TOP 50 WORLD STEEL PRODUCERS

second, with 2,962 more staff.

Since staff reduction historically is the thing to do in a recession, this category was added this year, limiting it to seven firms. The winner here was British Steel Corp., with a well publicized and controversial staff reduction of 22,600 persons. In second place was U.S. Steel, with a reduction of 13,692.

It is noteworthy that cutbacks in staff are occurring worldwide among many major steel producers and are not confined to a few unwieldy giants.

Despite cutbacks and reduced steel output at most steel producing operations worldwide, there were some major increases in steel production (see table). The list of the top ten steel production leaders, as measured in metric tons produced, includes five from the United States, with U.S. Steel Corp. showing the best improvement in production over all 50.

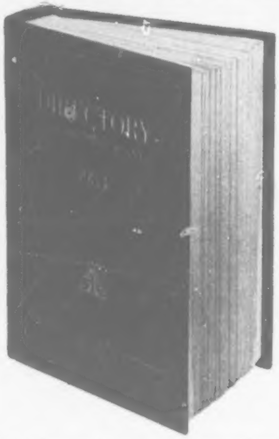
The top ten "Tons Produced Per Employee" leaders included no steel producers from the U.S. Although the firms on this list were much more efficient than the rest of the steel producers, it is interesting to observe that only three out of the ten improved their output per employee during 1983. Seven showed declines and were slightly less efficient.

Remember that the 1983 employment figures may not agree with those reported for 1982 in our previous survey, due to the clarification of who is an employee to be counted in the 1983 survey. However, the figures used in the above 1983/1982 comparison are current and comparable. The 1982 figures were reported in 1984 and are not carried over from our previous survey.

Examination of the firms, and their countries, supports various reports published in newspapers and magazines that the battle for efficiency in the steel industry is being waged in the Orient,

(Cont. on p. 107)

600-PAGE STEEL INDUSTRY FACT BOOK



Authoritative, more complete than ever—published by Association of Iron and Steel Engineers. ☐ Listings on more than 1,400 companies (over 16,000 individuals). Information on all U.S. and Canadian steel companies, plus many overseas producers and most major suppliers to the industry.

☐ DIRECTORY IRON AND STEEL PLANTS, Suite 2354,
Three Gateway Center,
Pittsburgh, PA 15222.

ORDER FORM

$30 in U.S. and Canada
(6% sales tax in Pennsylvania).
$36 if sent overseas. U.S. funds only.

Visa or MasterCard No. ____
Expiration date ____
Company Purchase Order No. ____
☐ Check enclosed
Name ____
Company ____
Address ____
City ____
State ____ Zip Code ____
Signature if card payment ____

For Information, Circle 125

World's Top 50 Steel Producers in 1983

1983 Rank	(1982 Rank)	Company (Country)	Year	Crude Steel Production (metric tons)	Maximum Capability (metric tons)	Exports As % of Shipments	No. of Employees (Steelmaking)	Tons per Employee	Capital Expenditures 1984 Forecast 1983 Actual (Millions)
1	(1)	Nippon Steel	1983	26,852,802	54,514,000	36.0	64,100	418.9	Yen 160,000
		(Japan)	1982	28,319,963	54,514,000	34.0	65,291	433.7	Yen 240,000
2	(5)	U. S. Steel	1983	13,440,000	28,409,000	1.0	49,095	273.7	$1,827
		(U.S.A.)	1982	10,988,000	30,461,000	1.0	62,787	175.0	$1,470
3	(4)	British Steel	1983	12,700,000	21,000,000	26.8	81,100	156.6	£200 F1
		(England)	1982	11,400,000	21,000,000	25.2	103,700	109.9	£200 F1
4	(2)	Finsider	1983	12,165,000	21,400,000	33.0	94,100	129.3	Lire 1,500,000
		(Italy)	1982	13,336,628	21,900,000	31.0	99,700	133.8	Lire 1,400,000
5	(3)	NKK (Nippon	1983	11,411,000	21,030,000	33.0	25,337	450.4	Yen 118,000
		Kokan K.K.) (Japan)	1982	11,993,000	21,030,000	39.0	25,785	465.1	Yen 135,300
6	(7)	Kawasaki Steel	1983	10,358,000	20,780,000	37.3[1]	28,524	363.1	Yen 115,000 F1
		(Japan)	1982	10,863,000	20,780,000	41.5	29,496	368.3	Yen 130,000 F1
7	(6)	Sumitomo Metal	1983	10,339,000	21,680,000	38.1	28,784	359.2	Yen 80,000 F1
		Industries (Japan)	1982	10,883,000	21,680,000	45.3	29,570	368.0	Yen 133,000 F1
8	(9)	Bethlehem Steel	1983	9,699,725	19,636,019	2.0	35,052	276.7	$400
		(U.S.A.)	1982	9,544,544	20,035,181	1.0	43,545	219.2	$269.4
9	(13)	Siderbrás	1983	9,100,000					
		(Brazil)	1982	7,700,000					
10	(8)	Thyssen Stahl[2] (F2)	1983	8,811,000	20,383,000		49,638	177.5	
		(West Germany)	1982	10,248,000	20,550,000		51,412	199.3	DM 443
11	(12)	USINOR	1983	8,500,000	11,400,000	N.A.	39,963	212.7	N.A.[3]
		(France)	1982	8,700,000	11,400,000	40.0	41,867	207.8	FF 1,640
12	(11)	Pohang Iron & Steel	1983	8,438,100	9,100,000	30.0	12,241	689.3	US $382,340
		(South Korea)	1982	8,780,954	8,500,000	35.0	12,103	725.5	US $139,784
13	(18)	Jones & Laughlin/LTV	1983	6,985,000	11,800,000		29,000	240.9	N.A.
		(U.S.A.)	1982	5,896,000	11,800,000		31,000	190.2	$244.5
14	(10)	Sacilor	1983	6,976,000		48.7	67,500	103.3	N.A.[4]
		(France)	1982	8,907,000		51.0	60,353	147.6	FF 1.8
15	(15)	SAIL	1983	6,100,000					
		(India)	1982	6,700,000					Rs 5,252
16	(16)	Kobe Steel	1983	6,062,000	8,662,000	23.7	13,069	463.8	N.A.
		(Japan)	1982	6,428,000	8,662,000	23.2	13,479	476.9	Yen 92,000
17	(19)	Inland Steel	1983	5,720,677	9,300,000		20,500	279.1	
		(U.S.A.)	1982	4,691,028	9,300,000		21,000	223.4	
18	(22)	Republic Steel	1983	5,700,000					
		(U.S.A.)	1982	4,613,000			30,257	152.5	$117.5
19	(17)	Broken Hill Pty.	1983	5,601,338	7,620,000	28.2	30,836	181.6	
		(Australia)	1982	6,371,786	8,900,000	23.1	41,858	152.2	$113
20	(20)	Armco	1983	5,430,933	7,900,000	1.3	21,596	251.5	$127.5[5]
		(U.S.A.)	1982	4,811,695	9,400,000	1.5	18,634	258.2	$104.4
21	(14)	Iscor	1983	5,409,600	5,800,000	35.0	43,615	124.0	R 316.0[6]
		(South Africa)	1982	6,936,800	7,200,000	30.0	50,538	137.3	R 286.4
22	(21)	National Steel	1983	4,814,355					
		(U.S.A.)	1982	4,989,407			17,100	291.8	$109.3
23	(23)	Cockerill Sambre	1983	4,724,000		62.0[7]	19,899	237.4	
		(Belgium)	1982	4,559,000		63.0[8]	21,241	214.6	
24	(25)	Klöckner-Werke	1983	4,400,000					
		(West Germany)	1982	4,419,000			30,301	145.8	
25	(26)	Stelco	1983	4,334,622	7,245,590	23.0	19,519	222.0	N.A.
		(Canada)	1982	4,166,004	6,961,700	33.2	22,104	188.5	C $44,876
26	(27)	Hoogovens Grocp.	1983	4,277,000	7,200,000	67.4	17,850		DFL. 375.
		(Netherlands)	1982	4,122,000	7,200,000	64.7	18,840		DFL. 379
27	(28)	Hoesch Werke	1983	3,929,000		34.0	35,300	111.3	N.A.
		(West Germany)	1982	4,070,000		33.0	38,200	106.5	DM 225
28	(31)	Krupp Stahl	1983	3,904,000		27.0	29,075	134.3	N.A.
		(West Germany)	1982	3,991,000		29.0	35,840	111.4	DM 156
29	(29)	Voest-Alpine	1983	3,800,400		61.0	18,500	205.4	
		(Austria)	1982	4,170,800		62.0	19,400	215.0	
30	(24)	ENSIDESA	1983	3,799,872	6,000,000	38.0	22,356	170.0	Pts 16,700
		(Spain)	1982	4,449,596	6,000,000	33.0	22,556	199.5	Pts 5,952
31	(32)	Sidermex	1983	3,777,000	5,700,000	22.0	39,098	96.6	$ Mex. 79,145
		(Mexico)	1982	3,985,000	5,700,000	7.0	37,331	106.7	$ Mex. 54,660
32	(49)	China Steel	1983	3,411,010	3,250,000	33.0	7,554	451.6	US $251.2
		(Taiwan)	1982	2,316,707	3,250,000	46.0	6.180	374.9	US $104.9
33	(35)	Dofasco	1983	3,360,000	4,200,000		12,600	266.7	C $ N.A.
		(Canada)	1982	3,270,000			12,700	257.5	C $50
34	(34)	Arbed	1983	3,200,000	4,600,000	96.0	13,500	237.0	Flux 1,700
		(Luxembourg)	1982	3,500,000	4,600,000	96.0	15,100	231.8	Flux 2,100
35	(33)	Salzgitter	1983	3,122,200	7,100,000	39.1	14,132	220.9	
		(West Germany)	1982	3,515,700	7,100,000	41.2	14,856	236.7	
36	(30)	Mannesmann	1983	3,100,000					
		(West Germany)	1982	4,000,000					
37	(45)	COSIPA	1983	3,018,000	3,160,000	45.0	14,096	214.1	Cr $357,000
		(Brazil)	1982	1,854,269	3,160,000	29.0	14,375	129.0	Cr $99,000
38	(41)	CSN	1983	2,864,000	N.A.[9]	49.0	21,883	131.0	Cr $128
		(Brazil)	1982	2,301,000		25.0	22,805	100.9	Cr $113
39	(37)	N. V. Sidmar	1983	2,813,254	3,500,000	92.0	6,306	446.1	BF 1,392
		(Belgium)	1982	2,616,000	3,500,000	94.0	6,375	410.4	BF 1,521

World's Top 50 Steel Producers in 1983

40	(36)	USIMINAS	1983	2,690,243	3,500,000	22.0	12,994	207.0	Cr $15,000,000[10]
		(Brazil)	1982	2,880,557	3,500,000	11.0	13,321	216.2	Cr $3,667,500
41	(42)	Svenskt Stal	1983	2,600,000	3,100,000	38.0	9,900	262.6	Skr 1,000
		(Sweden)	1982	2,200,000	3,100,000	38.0	9,900	222.2	Skr 900
42	(39)	Nisshin Steel	1983	2,585,000	5,481,000	25.3	8,965	288.3	Yen 22,054
		(Japan)	1982	2,512,000	5,481,000	22.6	8,846	284.0	Yen 43,577
43	(40)	Arbed Saarstahl	1983	2,397,000	3,700,000	41.0	16,236	147.6	DM 50
		(West Germany)	1982	2,388,000	3,700,000	40.0	18,015	132.6	DM 70
44	(43)	SIDOR	1983	2,159,000	4,800,000	42.0	15,446	139.8	B 465
		(Venezuela)	1982	2,003,000	4,800,000	14.0	15,753	127.2	B 690
45	(46)	Algoma	1983	2,092,000					N.A.
		(Canada)	1982	1,723,000					C $31.6
46	(49)	Wheeling-Pittsburgh	1983	2,020,000	4,000,000	0.02	7,512	268.9	N.A.
		Steel (U.S.A.)	1982	1,650,000	4,000,000	0.02	8,036	205.3	$91.9
47	(44)	Tata Iron & Steel	1983	1,935,000	2,120,000		64,757	29.9	Rs 781 F1
		(India)	1982	1,956,000	2,000,000		64,038	30.5	Rs 822 F1
48	(47)	Rautaruukki Oy	1983	1,632,000		45.0	5,560	293.5	FIM 350
		(Finland)	1982	1,682,000		36.0	5,630	298.8	FIM 195
49	(50)	Altos Hornos de	1983	1,377,000	1,350,000	30.0	9,880	139.4	Ptas. 9,728
		Vizcaya (Spain)	1982	1,350,000	1,350,000	20.0	10,243	131.8	Ptas. 9,728
50	(51)	Nucor	1983	1,156,654	1,700,000	0			$35
		(U.S.A.)	1982	920,788	1,700,000	0			$20

Footnotes

F1	Fiscal Year	April 1-March 31
F2	Fiscal Year	October 1-September 30
F3	Fiscal Year	July 1-June 30

[1] Exports (Pct), first half of fiscal '83

[2] Includes Thyssen Bandstahl Berlin, Thyssen Grillo Funke and Nedsteel (Netherlands).

[3] Planned but not budgeted expenditures — FF 3,000 million

[4] Planned capital expenditures, 1982-86 — FF 8.5 million

[5] Planned capital expenditures, 1985 — $138.8 million

[6] Planned capital expenditures, 1985 — Rand 216 million

[7] Exports to EEC — 44%; others, 18%

[8] Exports to EEC — 45%; others, 18%

[9] Capacity, 1984 — 3,000,000 m tons and,
1985 — 4,000,000 m tons.

[10] Capital expenditures planned, 1985 — MCr $125,882,879

Rank	Company Names Behind the Acryonyms
9	Siderbrás—Siderurgia Brasileira S.A.
11	USINOR—Union Sidérurgique du Nord et de l'Est de la France
14	Sacilor—Aciéries et Laminoirs de Lorraine
15	SAIL—Steel Authority of India, Ltd.
21	Iscor—South African Iron & Steel Industrial Corp., Ltd.
25	Stelco—The Steel Company of Canada, Ltd.
30	ENSIDESA—Empresa Nacional Siderurgica, S.A.
33	DOFASCO—Dominion Foundries & Steel Ltd.
37	COSIPA—Companhia Siderúrgica Paulista
38	CSN—Companhia Siderúrgica Nacional
40	USIMINAS—Usinas Siderúrgicas de Minas Gerais S.A.
44	SIDOR—CVG Siderurgica del Orinoco

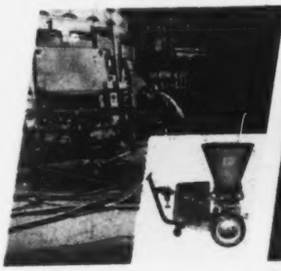
METEC84
Düsseldorf, 22.–28. 6. 1984
ALIVA Ltd.
hall 3 · stand 3 A 13

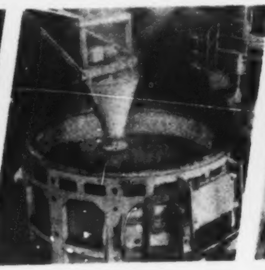
Aliva Ltd.
P.O. Box 69
CH-8967 Widen
Switzerland

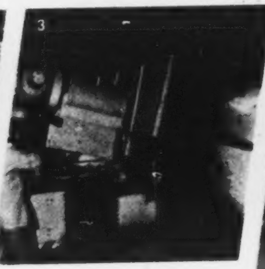
Tel. int. + 4157-3111 50
Telex 55449 aliva ch

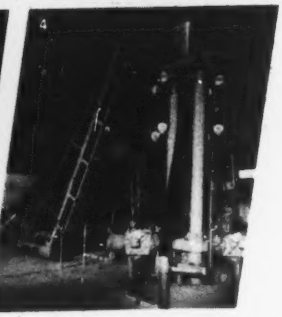
aliva

1. Aliva refractory spraying machine
2. Aliva centrifugal slinging machine
3. Aliva converter gunning unit
4. Aliva ladle ramming units









Aliva refractory processing plants have revolutionized maintenance operations on casting ladles and melting furnaces worldwide:

By rationalization, automation, enhanced durability, reduction of harmful emissions to a minimum, objective consulting service and a competent, international client service.
Aliva – economic without compromising.

For Information, Circle 129

with Japan, S. Korea and Taiwan being extremely competitive.

Most suppliers to the world steel producing market are interested in capital improvement plans, i.e. new plant and equipment, or modernization programs. Last year the survey indicated there was about $7 billion earmarked for expansion and improvements. This year the total is well over $8 billion, worldwide.

Since the 1983 survey was made earlier in the year than was the case in previous surveys, many budgets had not yet been finalized. A few firms indicated some very healthy on-going programs that will extend further into the future than the scope of the survey. (See footnotes to the table.)

U.S. Position Strengthens

On an overall basis, the survey reveals that the U.S. producers are indeed improving their competitive performance position. Five of the U.S. producers produced more steel in 1983 than in 1982 and five improved productivity on a tons per employee basis. Two of the seven leading companies worldwide that improved efficiency by reducing staff were U.S. companies.

U.S. Steel Corp.'s performance is particularly noteworthy in that it increased output while reducing the size of its plant and decreasing its number of employees. Despite much controversy in the news media, and much adverse criticism, the company is making progress and is investing heavily in new plant and equipment. In 1983, U.S. Steel spent $1.47 billion, and in 1984 it has earmarked $1.827 billion for modernization.

Overseas, the figures for British Steel show serious intent at improving its lot, along with some successes. Production is up and employment is down.

Looking at the overall picture, it appears that all are going to experience difficulty in managing their production efficiencies until the world steel supply is in tune with demand. It is apparent in the Japanese situation that capacity and efficiency do not guarantee sales when demand declines. ☐

Reprints available while supply lasts. For single copy, circle No. 99 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1006

What business does a handsome dog like me have with a top cat like you?

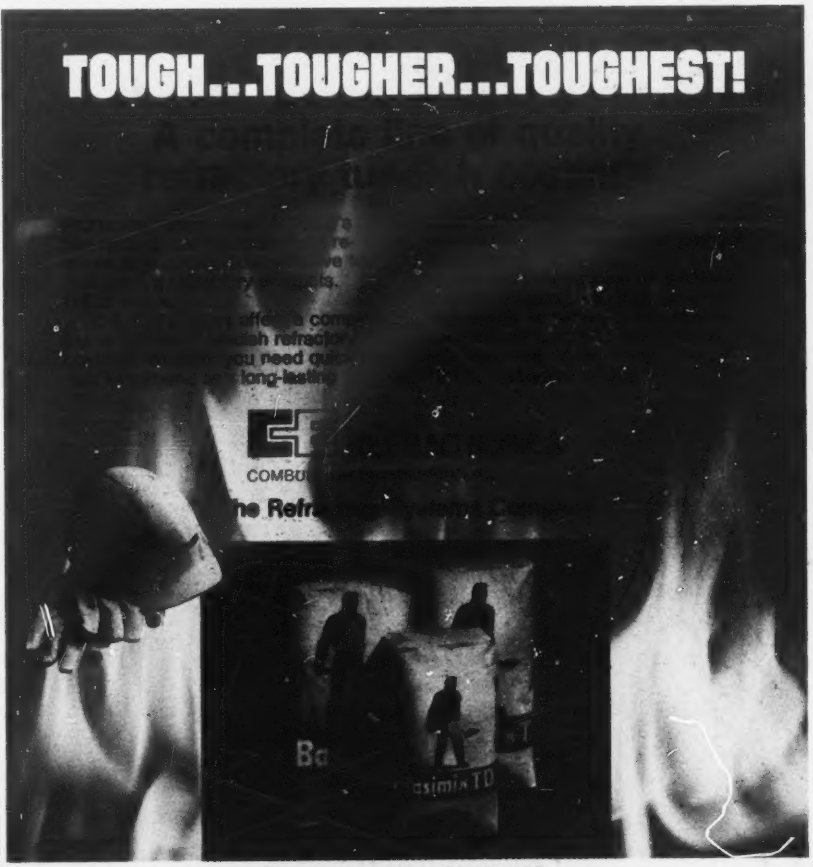
My name's McGruff,™ and it's my business to help prevent crime. I think it should be your business, too—to teach your employees how to protect themselves. Just send for my business kit—it'll help you develop a program that teaches your employees how to make their homes burglar-proof, make their neighborhoods safer, even how not to get mugged.

So take the time, and...

TAKE A BITE OUT OF CRIME

Write to McGruff, Crime Prevention Coalition, 20 Banta Place, Hackensack, NJ 07601 for lots of information on Crime Prevention.

Ad Council A message from the Crime Prevention Coalition, this publication and The Ad Council.
©1980 The Advertising Council, Inc.



For Information, Circle 130

PRICE & PRODUCTION DATA

(Effective April 9, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	256	257	241	198
Buffalo	11	11	11	32
Pittsburgh	293	309	295	213
Youngstown	123	114	124	93
Cleveland	144	150	128	138
Detroit	178	181	164	123
Chicago	567	579	555	476
Cincinnati	126	117	105	103
St. Louis	85	87	77	71
Southern	226	229	224	125
Western	90	84	82	79
U.S. Production	2,099	2,118	2,006	1,651

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective April 9, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,099	2,118	27,218	20,081
Capability Utilization Rate	80.8	82.0	75.2	49.5

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.939	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 90.17	$ 90.17	$ 91.83	$ 71.17
No. 2 bundles	$ 60.83	$ 61.83	$ 62.83	$ 49.17

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$100.50	$100.50	$100.50	$ 75.50
No. 1 steel, Philadelphia	84.50	84.50	87.50	65.50
No. 1 steel, Chicago	85.50	85.50	87.50	72.50
No. 1 bundles, Detroit	89.50	88.50	95.50	75.50
Low Phos., Youngstown	96.50	96.50	99.50	69.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	76.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	114.50	114.50	111.50	110.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective April 9, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	75.00-76.00	76.00	4/6/84
Lead	26.00-28.00	25.00-28.00	3/29/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	53.00	51.00-53.00	3/12/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.50
Calcium, ton lots, crown	$3.50
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$382.40
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$318-$325
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$9.125
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

March 2—576.49
March 3—576.36
March 4—577.29
March 5—577.02
March 6—577.16

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	70	60¼
Yellow brass	64	57
Red brass	66	57¾
Comm. bronze	66¾	58
Mang. bronze	65¾	57¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	66
No. 2 copper wire	56
Light copper	47

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	52
Light copper	43
No. 1 composition	59
No. 1 comp. turnings	57
Hvy. yellow brass solids	40
Hvy. yellow brass turnings	35
Radiators	49

Aluminum

New mixed clips	51	—52
Old sheet	50	—51
Old cast	50	—51
Clean dry borings	50	—51

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	46	—48
Mixed L.C. clips	41	—43
Old sheets and cast	37	—38
Borings and turnings	29	—30
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	53	—54
No. 2 copper wire	44	—45
Light copper	38	—39
Radiators	36	—37
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	47	—48

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	115	—125
Nickel rod ends	115	—125
Nickel sheets, clips	115	—125
Nickel turnings	60	— 65

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE APRIL 9, 1984

(Effective April 9, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to $101.00
No. 2 hvy. melting	90.00 to 91.00
No. 1 dealer bundles	116.00 to 117.00
No. 1 factory bundles (auto)	118.00 to 119.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	112.00 to 113.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	54.00 to 55.00
Cast iron borings	53.00 to 54.00
Low phos. punchings plate	119.00 to 120.00
Heavy turnings	90.00 to 91.00
No. 1 RR hvy. melting	111.00 to 112.00
Rails 2 ft. and under	120.00 to 121.00
Scrap rails, random lgth.	104.00 to 105.00
RR specialties	121.00 to 122.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	600.00 to 610.00
18-8 turnings	490.00 to 500.00

Chicago

No. 1 hvy. melting	$ 85.00 to $ 86.00
No. 2 hvy. melting	81.00 to 82.00
No. 1 dealer bundles	112.00 to 113.00
No. 1 factory bundles (auto)	114.00 to 115.00
No. 2 dealer bundles	64.00 to 65.00
No. 1 busheling	105.00 to 106.00
Shredder scrap	102.00 to 103.00
Machine shop turn.	46.00 to 47.00
Mixed bor. and turn.	47.00 to 48.00
Shoveling turnings	56.00 to 57.00
Cast iron borings	58.00 to 59.00
Low phos. forge crop	122.00 to 123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to 133.00
Low phos. 2 ft. and under	127.00 to 128.00
No. 1 RR hvy. melting	107.00 to 108.00
Scrap rails, random lgth.	107.00 to 108.00
Reroller rails	112.00 to 113.00
Rails, 2 ft. and under	126.00 to 127.00
RR couplers and knuckles	110.00 to 111.00
RR car axles	134.00 to 135.00
No. 1 machinery cast	114.00 to 115.00
Cupola cast	108.00 to 109.00
Stove plate	106.00 to 107.00
Steel car wheels	120.00 to 121.00
Stainless	
18-8 bundles and solids	550.00 to 560.00
18-8 turnings	450.00 to 460.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 83.00 to $ 86.00
No. 2 hvy. melting	73.00 to 76.00
No. 1 dealer bundles	101.00 to 104.00
No. 2 dealer bundles	57.00 to 60.00
No. 1 busheling	101.00 to 104.00
Shredder scrap	97.00 to 100.00
Machine shop turn.	29.00 to 32.00
Mixed bor. and turn.	29.00 to 32.00
Shoveling turnings	47.00 to 50.00
Low phos. 5 ft. and under	97.00 to 100.00
Low phos. 2 ft. punchings	117.00 to 120.00
Electric furnace bundles	112.00 to 115.00
RR specialties	105.00 to 108.00
Rails, 2 ft. and under	115.00 to 118.00
Cupola cast	70.00 to 73.00
Heavy breakable cast	57.00 to 60.00
No. 1 machinery cast	99.00 to 102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to $ 66.00
No. 2 hvy. melting	62.00 to 63.00
No. 1 dealer bundles	89.00 to 90.00
No. 2 bundles	44.00 to 45.00
No. 1 busheling	88.00 to 89.00
Drop forge flashings	62.00 to 63.00
Machine shop turn.	45.00 to 46.00
Mixed borings and turn.	28.00 to 29.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	48.00 to 49.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	475.00 to 485.00
18-8 turnings	375.00 to 385.00
430 bundles and solids	120.00 to 130.00

Youngstown

No. 1 hvy. melting	$ 83.00 to $ 86.00
No. 2 hvy. melting	67.00 to 70.00
No. 1 dealer bundles	98.00 to 101.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	95.00 to 98.00
Electric furnace bundles	91.00 to 94.00
Galvanized bundles	84.00 to 87.00

Cleveland

No. 1 hvy. melting	$ 76.00 to $ 79.00
No. 2 hvy. melting	50.00 to 53.00
No. 1 dealer bundles	94.00 to 97.00
No. 1 factory bundles	97.00 to 100.00
No. 2 bundles	30.00 to 33.00
No. 1 busheling	93.00 to 96.00
Machine shop turn.	13.00 to 16.00
Mixed bor. and turn.	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	116.00 to 119.00
Low phos. punchings plate	116.00 to 119.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	122.00 to 125.00
Rails, 18 in. and under	123.00 to 126.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	107.00 to 110.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00 to $ 75.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 busheling	89.00 to 90.00
No. 1 dealer bundles	89.00 to 90.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	25.00 to 26.00
Low phos. plate	102.00 to 103.00
Structural and plate, 2 ft. and under	102.00 to 103.00
Rails, 2 ft. and under	97.00 to 98.00
Scrap rails, random lgth.	77.00 to 78.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 78.00 to $ 79.00
No. 2 hvy. melting	67.00 to 68.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	78.00 to 79.00
No. 2 bundles	65.00 to 66.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	38.00 to 39.00
No. 1 RR hvy. melting	84.00 to 85.00
Rails, random length	82.00 to 83.00
Rails, 18 in. and under	94.00 to 95.00
RR specialties	92.00 to 93.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	88.00 to 89.00
Cast iron car wheels	57.00 to 58.00
Rerolling rails	90.00 to 91.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 77.00 to $ 78.00
No. 2 heavy melting	71.00 to 72.00
No. 1 dealer bundles	82.00 to 83.00
No. 2 bundles	57.00 to 58.00
No. 1 busheling	82.00 to 83.00
Shredder scrap	104.00 to 105.00
Machine shop. turn.	41.00 to 42.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	50.00 to 51.00
Electric furnace bundles	75.00 to 76.00
Elec. furnace, 3 ft. & under	80.00 to 81.00
Structural and plate, 2 ft.	108.00 to 109.00
Structural and plate, 4 ft.	105.00 to 106.00
No. 1 RR hvy. melting	105.00 to 106.00
Scrap rails, random lgth.	95.00 to 96.00
Rails, 2 ft. and under	110.00 to 111.00
Angles and splice bars	105.00 to 106.00
No. 1 cupola cast	94.00 to 95.00
Unstripped motor blocks	74.00 to 75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to $ 72.00
No. 2 hvy. melting	65.00 to 66.00
No. 1 dealer bundles	85.00 to 86.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	29.00 to 30.00
Low phos. 18 in. and under	103.00 to 104.00
Rails, random length	84.00 to 85.00
Rails, 2 ft. and under	99.00 to 100.00
No. 1 cupola cast	74.00 to 75.00
Heavy breakable cast	38.00 to 39.00
Drop broken cast	90.00 to 91.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 52.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	510.00 to 530.00
18-8 turnings	410.00 to 430.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to $ 70.00
No. 2 hvy. melting	58.00 to 60.00
No. 1 dealer bundles	73.00 to 75.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	76.00 to 78.00
Shredder scrap	73.00 to 75.00
Machine shop turn.	12.00 to 14.00
Shoveling turnings	18.00 to 20.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to $ 47.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	35.00 to 37.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 48.00 to $ 50.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	38.00 to 40.00
No. 2 dealer bundles	18.00 to 20.00
Machine shop turn.	10.00 to 12.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	42.00 to 44.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 81.00 to $ 82.00
No. 2 hvy. melting	67.00 to 68.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	18.00 to 19.00
Crushed turnings	42.00 to 43.00
Shredder scrap	83.00 to 84.00
Cut structural plate 2 ft. and under	95.00 to 97.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	80.00 to 81.00

CAPITAL SPENDING KEYS ORDERS GAIN

Economists are referring to American economic developments as "boomlike," and all major indicators seem to justify the assessment. February durable goods orders continued their upward movement, rising 0.9 pct in the second month compared with January, the U.S. Commerce Department reported.

Non-military capital goods orders led the slight surge of orders by U.S. factories—a 6.3 pct increase in February compared with January. This sector, which is a key indicator of businesses' future plans for plant and equipment, continues to hold strongly. In dollars, the figure was $26.9 billion compared with $25.3 billion in January.

New orders for durable goods totaled $101.8 billion up about 0.9 pct from the $100.9 billion registered in January. No large jumps were registered among the 23 categories shown, with the exception of overall machine tool orders—an almost 7 pct increase. Within that category, metalforming machine tools orders increased 24.7 pct to $69.7 million compared with $55.9 million the previous month. Overall, machine tools orders were $202.3 million in February, versus $189.1 million in January. However, orders for metalcutting machine tools dropped 0.5 pct to $132.6 million.

In the always fluctuating category of defense capital goods spending, the February statistics show a 13.6 pct increase to $7.5 billion compared with $6.6 billion in January.

Steel new orders, which were characterized as having "rebounded" in January, dropped 22 pct in February to $4.8 billion after registering $5.9 billion in the first month of 1984.

Taking away the categories which were unchanged month-to-month—farm machinery and equipment, general industrial machinery, and construction, mining, and materials handling equipment—increases and drops were about equally divided, 11 up and nine down.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted Source: U.S. Dept. of Commerce		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$321.6	$304.7	$303.2
Manufacturing, Total	4th Qtr.	115.0	111.1	110.2
Manufacturing, Durable Goods	4th Qtr.	53.5	53.0	50.5
Mining Industry	4th Qtr.	13.1	11.9	13.4
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Feb.	101.8	100.9	78.4
Shipments	Feb.	96.0	95.1	77.4
Inventories	Feb.	172.9	170.7	173.5
Unfilled Orders	Feb.	335.0	329.2	289.7
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Feb.	26.9	25.3	25.1
Capital Goods Producers, Defense Industries	Feb.	7.5	6.6	6.1
Primary Metals, Total	Feb.	11.2	12.6	9.8
Steel (SIC 331)	Feb.	4.8	5.9	4.1
Iron & Steel Castings (SIC 332)	Feb.	1.3	1.4	1.0
Nonferrous Metals	Feb.	5.1	5.3	4.9
Nonelectrical Mach.-Equip. Industries, Total	Feb.	17.1	17.3	12.5
Engines & Turbines	Feb.	1.2	0.9	1.0
Farm Machinery & Equipment (Shipments)	Feb.	1.0	1.0	0.8
Construction, Mining & Mat. Hdlg. Equip.	Feb.	2.6	2.6	1.8
General Industrial Machinery	Feb.	1.3	1.3	1.2
Fluid Power Equipment** (Index-1972=100)	Feb.	318.0	296.0	197.0
Metalworking Machinery	Feb.	0.8	0.9	0.6
Machine Tools, Total ($ Mill., Unadjusted)***	Feb.	202.3	189.1	98.0
Machine Tools, Metalcutting***	Feb.	132.6	133.2	77.9
Machine Tools, Metalforming***	Feb.	69.7	55.9	20.1
Electrical Mach. & Equip. Industries, Total	Feb.	15.9	15.3	12.2
Elec. Transmission Equip. & Ind. Apparatus	Feb.	2.0	1.9	1.1
Household Appliances	Feb.	1.3	1.5	1.1
Communication Equipment	Feb.	5.3	4.2	4.2
Transportation Equip. Industrial, Total	Feb.	27.1	25.7	18.1
Motor Vehicles & Parts (Shipments)	Feb.	16.7	16.8	11.3
Aircraft, Missiles & Parts	Feb.	7.6	6.8	5.6
Shipbuilding & Military Tanks	Feb.	1.9	0.8	0.4
Fabricated Metal Products, Total	Feb.	11.4	11.1	9.6
Instruments, Total	Feb.	4.2	4.6	4.0

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA

CHILTON'S

IRONAGE

May 7, 1984

BOTTOM POURING: STEEL PRODUCERS BREAK WITH TRADITION

Annual Steel/ Nonferrous Financial Analysis

Plus
In Plant Spotlight: U.S. Steel's New Caster at Lorain

And
The Hot Spot

MAY 7, 1984 VOL. 227, NO. 9

CHILTON'S
IRON AGE
METALS PRODUCER

Cover: USS' Lorain steel works. / Above: Bottom pouring at Allegheny Ludlum.

Editorial 7
Hey, where have you been fellas?

Newswatch 13
National sells a stake in its steel operations to NKK.

The Hot Spot 23
To succeed, go back to basics.

Steel/Nonferrous Analysis 27
Another year of red ink for the steel industry.

Bottom Pouring 37
There's a resurgence of interest in its benefits.

West Coast Steel 49
Hard knocks have taught its officials invaluable lessons.

In-Plant Spotlight 57
USS' Lorain Works gets boost with new caster.

Materials Report 68
Steelmakers will ship 40 million tons in the first half.

Price Trends 82
Prices continue to rise at moderate rate.

Next Issue: World Hot Strip Mill Report.

Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 11
INDUSTRIAL BRIEFS 22
PERSONNEL TOUCH 61
PRODUCT & EQUIPMENT REVIEW 62
P&P DATA 4/24 70
AD INDEX 72
MANAGEMENT SERVICE CARD 73
BUSINESS STAFF 74
FERROUS SCRAP 4/24 75
STEEL PRICES 77
CLEARING HOUSE 80

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc

IRON AGE 1983 STEEL INDUSTRY FINANCIAL ANALYSIS

Company[1]	Year	Raw Steel Production Thousands of Net Tons	Steel Shipments Thousands of Net Tons	Net Sales & Operating Revenues Thousands of Dollars	Employment Costs Thousands of Dollars	Employment Costs as Percent of Sales	Operating Profit[2] 000 of $	Operating Profit as Percent of Sales	Depreciation Depletion and Amortization 000 of $	Provision for Federal Income Taxes 000 of $	Net Income 000 of $	Net Income Percent of Sales	Invested Capital (to included funded debt payable after one year preferred and common stock surplus) 000 of $	Net Income Percent of Investment[3]	Working Capital 000 of $	Funded Debt (Payable after 1 year) 000 of $	Interest Expense on Funded Debt 000 of $	Capital Expenditures 000 of $	Stockholders' Equity[4] 000 of $	Pct Return on Stockholders' Equity	Number of Common Shares Outstanding 000 of $	Common Stock 000 of $	Common Dividend Declared 000 of $	Earnings Per Common Share	Dividends Per Common Share	Price Range Common Share	P/E Ratio	
1. United States Steel Corp.[5,6]	1983	14,800	11,300	17,523,000	3,780,000	21.6	1,886,000	10.8	1,104,000	(62,000)	(1,161,000)	(6.6)	13,999,000	(8.3)	789,000	7,164,000	856,000	1,827,000	5,605,000	(20.7)	104,639	2,093,000	103,000	(12.07)	1.00	31-19⅝	(3)-(2)	1.
	1982	12,100	10,300	18,907,000	4,395,000	23.2	2,140,000	11.3	1,031,000	408,000	(361,000)	(1.9)	14,863,000	(2.4)	710,000	6,843,000	911,000	1,936,000	6,468,000	(5.6)	102,098	2,042,000	166,000	(3.99)	1.75	30⅛-16	(8)-(4)	
2. Bethlehem Steel Corp.	1983	10,692	8,744	4,898,200	2,202,700	45.0	107,000	2.2	251,700	68,000	(163,500)	(3.3)	2,447,300	(2.8)	270,400	1,134,200	94,500	269,400	1,313,100	(13.2)	46,250	559,400	26,600	(3.92)	.60	28½-19	—	2.
	1982	10,521	8,154	5,260,300	2,628,600	50.0	1,025,800	(19.5)	388,900	(27,000)	(1,469,600)	(27.9)	2,508,200	(55.5)	410,600	1,271,400	77,900	470,300	1,236,800	(53.2)	43,682	507,200	56,800	(33.64)	1.30	23½-14½	—	
3. LTV Corp.[7,8]	1983	7,653	5,811	4,577,800	1,534,300	33.5	13,200	0.3	110,100	(13,500)	(180,700)	(4.0)	2,757,500	(0.9)	537,400	1,560,200	154,900	254,700	1,420,000	(16.0)	54,649	1,004,175	13,171	(3.64)	.25	19⅛-11⅝	(3.8)	3.
	1982	6,486	5,142	4,776,800	1,723,100	36.1	(63,000)	(1.3)	101,500	(106,900)	(154,900)	(3.3)	2,674,500	(1.9)	819,100	1,459,900	105,000	290,100	1,115,800	(12.9)	49,020	557,603	21,400	(3.20)	.4375	17⅝-8⅛	(3.4)	
4. Inland Steel Co.	1983	6,306	4,762	3,006,564	1,084,396	35.6	12,070	0.4	123,179	(65,940)	(116,900)	(3.8)	1,918,969	—	232,737	787,659	65,521	103,125	1,131,310	—	24,727	346,498	12,420	(4.76)	.50	24¾-35	—	4.
	1982	5,171	4,086	2,843,989	1,105,654	39.4	(50,840)	—	125,296	(107,587)	(118,795)	(4.2)	1,957,469	—	265,110	758,747	64,559	94,175	1,198,722	—	21,342	283,829	23,975	(5.60)	1.125	18⅛-26¾	—	
5. Republic Steel Corp.	1983	6,300	4,846	2,701,107	984,998	36.5	(379,208)	(14.0)	130,269	(224,100)	(326,494)	(12.1)	1,991,206	(12.5)	168,301	822,667	78,170	117,487	1,168,539	(23.3)	16,963	178,224	8,489	(19.68)	.50	28½-15⅛	(1.1)	5.
	1982	5,086	4,345	2,738,160	1,175,211	42.9	(325,110)	(11.9)	86,070	(224,000)	(239,219)	(8.7)	2,256,010	(8.1)	313,216	852,974	56,671	214,799	1,403,036	(14.4)	16,183	161,827	18,206	(14.78)	1.125	24¾-13⅞	(1.3)	
6. Armco Inc.[9]	1983	5,787	4,324	4,164,600	1,643,200	39.5	(238,600)	(5.7)	195,500	(5,200)	(672,500)	(16.1)	2,120,900	(27.6)	562,600	832,000	87,500	149,200	1,288,900	(41.1)	66,245	331,300	32,900	(10.27)	.50	21¼-15⅞	—	6.
	1982	5,104	4,112	5,427,900	1,911,100	35.2	(328,700)	(6.1)	196,900	(278,300)	(345,100)	(6.4)	2,750,300	(9.7)	613,300	769,500	77,200	338,500	1,980,800	(15.5)	65,554	327,800	94,400	(5.41)	1.50	27⅞-14½	—	
7. National Intergroup, Inc.[10,11]	1983	5,308	4,597	2,992,703	—	—	25,073	0.8	119,755	250	(154,318)	(5.2)	1,605,447	(5.9)	251,893	605,522	59,386	109,260	874,925	(16.4)	20,318	101,590	4,950	(8.33)	.25	35⅜-17¼	—	7.
	1982	5,501	4,956	3,044,214	—	—	(523,355)	(17.2)	148,163	(274,950)	(462,773)	(15.2)	1,679,031	(23.6)	182,715	671,784	66,205	101,557	1,007,247	(37.0)	18,644	93,220	19,845	(24.77)	1.0625	24½-13⅞	—	
8. Wheeling-Pittsburgh Steel Corp.[12,13]	1983	2,222	1,642	831,260	315,470	38.0	5,934	0.7	40,361	(17,944)	(54,080)	(6.5)	899,614	(1.8)	101,216	513,928	37,597	91,905	385,686	(14.0)	4,028	40,280	—	(15.74)	—	28-15⅝	—	8.
	1982	1,818	1,368	775,403	355,221	45.8	(30,142)	(3.9)	38,219	(24,828)	(58,769)	(7.6)	939,623	(2.5)	230,026	495,915	35,402	160,211	443,708	(13.2)	4,005	40,051	—	(15.98)	—	30¼-12¼	—	
9. Nucor Corp.[14]	1983	1,575	1,441	542,531	118,693	21.9	81,429	15.0	27,110	19,700	27,864	5.1	303,861	10.6	105,402	45,731	4,458	19,617	258,130	11.4	14,044	22,561	4,217	1.98	.30	42¾-30⅛	21.6-15.2	9.
	1982	1,216	1,127	486,018	108,541	22.3	74,374	15.3	26,287	15,600	22,192	4.6	280,511	10.7	66,440	48,230	7,785	14,789	232,281	10.0	13,992	20,359	3,626	1.59	.26	31¾-17 1/16	20.0-10.7	
10. Chaparral Steel Co.	1983	884	769	212,876	34,373	16.2	23,661	11.1	14,381	(10,956)	(13,221)	(6.2)	184,966	6.6	8,126	171,966	25,336	320	60,219	(22.0)	4,500	4,500	—	(2.94)	—	—	—	10
	1982	597	532	159,562	29,582	18.5	18,259	11.4	11,930	(5,787)	11,391	(7.1)	201,079	20.4	21,349	188,079	26,246	37,238	73,441	15.5	4,500	4,500	—	2.53	—	—	—	
11. Florida Steel Corp.[15]	1983	752	718	235,109	56,826	24.2	6,771	2.9	9,362	(4,600)	(4,677)	(2.0)	143,444	1.4	47,805	58,353	6,685	5,052	85,091	(5.3)	5,965	8,476	2,385	(.78)	.40	30¼-11¾	—	11.
	1982	753	648	248,543	59,669	24.0	2,384	1.0	9,250	(8,200)	(6,321)	(3.3)	150,676	0.9	45,345	58,661	9,655	6,603	92,015	(8.5)	5,963	8,339	3,631	(1.40)	.61	19⅞-10½	—	
12. Laclede Steel Co.	1983	618	418	190,149	69,886	36.8	11,921	6.3	5,580	—	5,048	2.1	85,112	8.8	47,512	15,295	2,404	2,493	69,817	7.2	2,704	54,329	—	2.24	—	18-10	8-4	12.
	1982	487	349	178,223	76,799	43.1	(3,355)	(1.9)	5,293	(3,176)	(8,106)	(4.5)	83,839	(6.5)	37,490	29,200	2,634	7,227	54,639	(14.8)	2,210	44,200	—	(3.67)	—	10-7	—	
13. CF&I Steel Corp.[16]	1983	614	501	231,093	97,450	42.2	(55,203)	(23.9)	38,483	(49,311)	(94,203)	(40.8)	109,914	(78.2)	(4,187)	—	5,357	19,547	109,914	(60.0)	3,966	19,829	—	(23.75)	—	28-21½	—	13.
	1982	794	617	362,835	177,145	48.8	(18,809)	(5.2)	41,645	(31,836)	(23,495)	(6.5)	254,117	(9.2)	12,991	50,000	79	97,336	204,117	(10.8)	3,966	19,829	3,966	(5.92)	1.00	36-21	—	
14. Cyclops Corp.	1983	549	790	1,024,114	269,827	26.4	18,975	1.9	17,849	(4,257)	(2,190)	(0.2)	265,282	0.9	142,131	92,597	7,573	21,223	172,685	(1.3)	3,877	3,877	3,880	(.72)	1.10	36½-19	—	14.
	1982	526	639	873,165	261,358	29.9	(1,379)	(0.2)	17,856	(15,709)	(11,921)	(1.4)	242,682	(3.2)	122,976	64,339	8,395	19,442	178,343	(6.7)	3,753	3,753	3,788	(3.60)	1.10	27⅛-13⅝	—	
15. Interlake Inc.[17,18,19]	1983	518	378	835,041	251,648	30.1	70,909	8.5	23,968	13,038	22,824	2.7	475,877	6.0	202,860	115,994	10,370	16,536	327,401	7.1	5,834	90,917	15,060	3.94	2.60	44¾-31¾	11.2	15.
	1982	420	327	767,300	268,969	35.1	34,602	4.5	22,956	272	5,752	0.7	470,550	2.5	175,891	122,338	10,993	27,864	323,251	1.6	5,708	87,010	15,998	.92	2.60	35½-22½	34.0	
16. Lukens, Inc.[20]	1983	429	—	342,855	—	—	5,712	1.7	19,699	(10,244)	(14,012)	(4.1)	208,036	(1.8)	47,689	84,598	10,269	8,575	123,438	(10.0)	5,155	3,180	2,070	(2.71)	.40	17½-11⅝	(6.5)-(4.3)	16.
	1982	495	—	389,678	—	—	28,835	7.4	17,561	(306)	1,479	0.4	232,044	5.0	53,376	91,894	10,101	15,131	140,150	1.0	5,193	3,180	3,760	.28	.72	13½-8¾	48.2-31.3	
17. Northwestern Steel & Wire Co.	1983	417	408	167,690	81,793	48.8	(25,661)	(15.3)	14,803	(21,383)	(19,162)	(11.4)	237,063	(8.0)	85,898	10,000	81	15,615	227,063	(8.4)	7,506	37,532	2,252	(2.55)	.30	26¾-15⅛	(10)-(6)	17.
	1982	1,041	809	323,303	126,873	39.2	(22,131)	(6.8)	16,074	(24,046)	(14,170)	(4.4)	248,477	(5.7)	84,979	—	11	57,745	248,477	(5.7)	7,506	37,532	7,506	(1.89)	1.00	26-14⅞	(14)-(8)	
18. Copperweld Corp.	1983	366	317	328,238	135,800	41.4	1,729	0.5	15,106	(19,564)	(22,013)	(6.7)	258,814	(5.1)	67,825	91,135	8,794	13,976	167,679	(13.1)	8,609	7,174	4,993	(2.64)	.58	21¾-15	—	18.
	1982	246	337	374,485	134,400	35.9	10,395	2.8	15,824	(6,533)	(10,128)	(2.7)	265,729	(1.4)	65,148	94,544	6,398	42,953	171,185	(5.9)	8,608	7,173	9,974	(1.18)	1.16	24¾-12¾	—	
19. Continental Steel Corp.[21,22]	1983	354	—	111,020	—	—	(6,406)	(5.8)	(5,077)	—	(9,938)	(8.9)	60,509	(14.2)	23,195	33,411	1,329	12,062	27,098	(36.6)	17,419	63,367	—	(.72)	—	3⅝-7/16	—	19.
	1982	281	—	99,950	—	—	(14,198)	(14.2)	(4,795)	(463)	(25,358)	(25.4)	57,416	(40.5)	28,354	22,479	2,097	3,843	34,937	(72.6)	10,559	50,446	—	(2.68)	—	2⅜-7/16	—	
20. Carpenter Technology Corp.[23]	1983	—	—	397,451	162,123	40.8	35,746	9.0	14,571	4,354	16,042	4.0	349,774	4.8	110,477	60,762	779	71,853	289,012	5.6	8,679	44,561	18,130	1.86	2.10	48-28	23.7	20.
	1982	—	—	487,964	182,218	37.3	64,417	13.2	13,099	17,814	33,162	6.8	341,670	9.8	145,305	53,308	342	62,139	288,362	11.5	8,614	44,522	18,084	3.85	2.10	50-30¼	8.1	
21. Athlone Industries, Inc.	1983	—	—	234,107	—	—	13,124	5.6	4,957	228	(493)	(0.2)	124,028	6.4	50,995	67,253	8,432	2,237	56,775	(0.9)	2,395	240	3,750	(.59)	1.60	26-16½	—	21.
	1982	—	—	242,505	—	—	11,535	4.8	4,749	(1,537)	2,338	1.0	131,019	9.3	57,855	75,238	9,903	3,717	55,781	4.2	2,342	234	3,760	.91	1.60	28½-14⅝	18.3	
GRAND TOTAL	1983	*	*	45,547,508	12,823,483	28.2	1,614,176	3.6	2,275,656	(403,429)	(2,937,623)	(6.5)	30,546,618	(4.7)	3,849,266	14,267,301	1,525,441	3,131,183	15,161,782	(19.4)	—	—	—	—	—	—	—	
	1982			48,767,397	14,719,440	30.2	2,029,601	4.2	2,313,777	(699,472)	(3,235,341)	(6.7)	32,587,942	(5.4)	4,461,566	14,021,530	1,488,576	4,001,669	16,951,092	(19.1)	—	—	—	—	—	—	—	
Percent change 1982 to 1983				(6.6)	(12.9)	—	(20.5)	—	(1.6)	(42.3)	9.2	—	(6.3)	—	(13.7)	1.8	2.5	(21.8)	(10.6)	—	—	—	—	—	—	—	—	

Parenthesis ( ) denotes loss or credit

N.A. indicates Not Available

Footnotes

1. Companies are ranked on the basis of raw steel produced in 1983.
2. Operating profit is income before depreciation, income taxes and interest on long-term debt.
3. Net income percent of investment is net income plus expense on funded debt divided by invested capital.
4. Stockholders' equity is total assets minus total liabilities.
5. USS—Invested capital includes long-term debt, notes payable, proceeds from production agreements, minority interest, preferred stock of consolidated subsidiary, preferred stock subject to mandatory redemption, and other preferred stock and common stockholders' equity.
6. USS—Beginning with 1982, all financial results and statistical data reflect the effect of the Marathon Oil Co. acquisition.
7. LTV—Invested capital is defined as long-term portions of borrowings, leases, deferred income, deferred income taxes, minority interest, obligation to exchange debt for common stock, preferred stock with mandatory redemption and shareholders' equity.
8. LTV—Common stock, total value, is defined as year-end market price ($18.375—1983; $11.375—1982) times outstanding shares of common stock at year-end.
9. Armco—Operating profit includes pretax special charges of $296,700 in 1983 and $460,300 in 1982 and excludes discontinued insurance operations ($136,000 loss in 1983 and $11,900 income in 1982).
10. National—Raw steel production, steel shipments, and net sales and operating revenues include the production, sales and shipments of the Weirton Steel Division through April 30, 1983, the effective date of the sale of the division to an ESOP established by the division employees. The operating results of the Weirton Steel Div. through April 30, 1983, were charged against a reserve established in the prior year to cover operating losses through the effective date of the sale.
11. National—Operating profit includes pretax write-offs and charges related to the sale of the Weirton Steel Div. and a restructuring of other operations totaling $155,633,000 in 1983, and $476,035,000 in 1982; equity earnings from First Nationwide Financial Corp. of $28,902,000 in 1983 and $11,102,000 in 1982; and an extraordinary gain of $22,094,000 in 1983 from the exchange of common stock for outstanding First Mortgage bonds.
12. Wheeling-Pittsburgh—Net sales and operating revenues includes $48,762,000 and $2,195,000 from the sales of tax benefits.
13. Wheeling-Pittsburgh—Net income in 1982 includes $20,166,000 from the cumulative effect on prior years (to Dec. 31, 1981) of a change in accounting principle—depreciation.
14. Nucor—Number of common shares outstanding, earnings per common share, dividends per common share, common stock price range and price/earnings ratio are adjusted for 2-for-1 stock split in September 1983.
15. Florida Steel—Fiscal year ends Sept. 30.
16. CF&I—Operating profit in 1983 does not include provision of $45,264,000 for restructuring of operations. Net income in 1983 includes pretax provision of $45,264,000 for restructuring of operations.
17. Interlake—Operating profit—excludes minority interest (net of tax) of $2,074,000 in 1983 and $1,210,000 in 1982.
18. Interlake—Provision for Federal income taxes represents all taxes on income.
19. Interlake—Invested capital includes retained earnings.
20. Lukens—Operating profit in 1983 reflects a $4,265,000 writedown of certain steel group assets, which increased 1983 net loss by $2,931,000 or 57¢ per share.
21. Continental—Provision for Federal income taxes includes provision for state income taxes.
22. Continental—Net income in 1982 includes a loss of $7,183,000 from discontinued operations and an extraordinary gain of $2,452,000 on pre-petition settlements.
23. Carpenter Technology—Fiscal year ends June 30.

***Iron Age has elected not to list the totals for steel production and shipments in the table of this year's Financial Analysis of the Steel Industry. For the record, according to the American Iron and Steel Institute, domestic raw steel production in 1983 totaled 84,615,000 net tons and steel shipments were 67,583,000 net tons. For 1982, production was 74,577,000 net tons; shipments were 61,567,000 net tons.**

IRON AGE 1983 NONFERROUS INDUSTRY FINANCIAL ANALYSIS

( ) Denotes Loss

Dollar Values in Thousands

Company	Year	Net Sales and Operating Revenues 000 of $	Operating Profit 000 of $	Operating Profit as Percent of Sales	U.S. and Foreign Income Taxes 000 of $	Extraordinary Income (Loss) 000 of $	Net Earnings 000 of $	Net Earnings as Percent of Sales	Net Earnings per Common Share	Dividends Per Common Share	Number of Common Shares Outstanding at Year End	Stockholders Equity 000 of $	Net Earnings as Percent of Stockholders Equity	Funded and Other Long Term Debt 000 of $	Invested Capital 000 of $	Long Term Debt as Pct of Invested Capital	Net Earnings as Percent of Invested Capital	Working Capital 000 of $	Capital Spending 000 of $	Retained Earnings at End of Year 000 of $	
1. Alcan Aluminium Ltd.	1983	5,208,000	159,000	3.0	73,000	—	73,000	1.4	0.81	0.90	96,029,000	2,799,000	2.6	1,499,000	4,298,000	34.9	1.7	1,452,000	382,000	1,967,000	1.
	1982	4,644,000	(12,000)	—	(9,000)	—	(58,000)	—	—	1.35	85,189,000	2,511,000	—	1,749,000	4,260,000	41.0	—	1,361,000	643,000	1,983,000	
2. Aluminum Co. of America	1983	5,263,431	154,884	2.9	49,600	9,681	174,231	3.3	2.15	1.20	80,939,222	3,227,511	5.5	1,683,139	4,910,850	34.3	3.6	939,395	410,689	2,724,864	2.
	1982	4,647,630	(204,824)	—	(144,100)	19,880	10,832	0.2	0.11	1.65	78,924,733	3,112,466	0.4	1,741,443	4,853,909	35.9	0.2	965,805	499,606	2,645,831	
3. AMAX Inc.	1983	2,290,100	53,400	2.3	45,900	—	(489,000)	—	—	0.20	66,453,085	1,861,900	—	1,127,700	2,989,600	37.7	—	5,900	124,900	495,100	3.
	1982	2,415,500	(42,900)	—	17,400	—	(390,100)	—	—	0.85	65,589,850	2,388,200	—	1,307,800	3,696,000	35.4	—	271,800	310,200	1,020,200	
4. Asarco Inc.	1983	1,512,236	19,320	1.3	18,892	—	58,329	3.9	1.54	0.40	28,254,434	1,024,657	3.9	490,143	1,654,800	29.6	2.4	165,438	105,172	852,952	4.
	1982	1,350,695	(94,087)	—	(11,803)	(35,376)	(74,080)	—	—	0.50	27,351,993	967,068	—	481,641	1,588,709	30.3	—	133,356	145,042	823,700	
5. Brush Wellman Inc.	1983	245,415	47,172	19.2	17,530	—	25,765	10.5	2.78	0.84	9,241,206	176,240	16.7	31,650	207,890	15.2	12.4	88,166	19,805	129,711	5.
	1982	193,900	34,246	17.7	12,590	—	18,547	9.6	2.13	0.80	8,538,463	132,212	14.3	64,671	196,883	32.8	9.4	71,000	16,168	111,739	
6. Cominco Ltd.	1983	1,374,700	197,700	14.4	(26,700)	—	(39,300)	—	—	0.40	21,008,523	869,900	—	649,400	1,519,300	42.7	—	187,000	106,300	490,600	6.
	1982	1,234,700	162,800	13.2	(43,000)	18,100	(31,200)	—	—	1.30	18,805,743	834,900	—	688,000	1,522,900	45.2	—	221,000	230,400	554,400	
7. Engelhard Corp.	1983	2,099,337	101,612	4.8	22,570	—	73,519	3.5	2.73	0.60	26,836,000	456,258	16.1	69,880	526,138	13.3	14.0	226,417	47,762	464,503	7.
	1982	2,018,885	78,940	3.9	6,468	—	64,811	3.2	2.41	0.56	26,856,000	411,522	15.7	65,844	477,366	13.8	13.6	189,000	61,316	410,565	
8. Freeport-McMoRan Inc.	1983	786,151	142,832	18.2	34,436	—	93,472	11.9	1.32	0.60	73,463,000	735,147	12.7	275,209	1,010,356	27.2	9.3	47,217	110,025	507,005	8.
	1982	747,888	130,534	17.5	5,876	—	65,946	8.8	0.95	0.60	69,817,000	735,130	9.0	481,027	1,216,157	39.6	5.4	61,072	479,768	586,071	
9. Handy & Harman	1983	575,900	36,198	6.3	9,720	—	10,610	1.8	0.77	0.60	14,611,000	129,735	8.2	93,115	222,850	41.8	4.8	106,993	15,067	112,412	9.
	1982	499,119	31,372	6.3	7,120	—	8,333	1.7	0.61	0.60	14,611,000	127,622	6.5	75,676	203,298	37.2	4.1	100,596	12,528	110,071	
10. Inco Ltd.	1983	1,173,421	(188,015)	—	(91,292)	—	(234,894)	—	—	0.20	97,462,791	1,362,725	—	1,055,705	2,418,430	43.7	—	528,085	71,079	606,658	10.
	1982	1,235,983	(157,754)	—	(119,927)	—	(203,342)	—	—	0.20	90,342,647	1,554,216	—	1,129,293	2,683,509	42.1	—	789,369	95,290	882,533	
11. Kaiser Aluminum & Chemical Corp.	1983	3,013,700	(206,500)	—	(131,600)	—	(74,900)	—	—	0.60	43,388,000	1,232,700	—	1,104,500	2,337,200	47.3	—	390,900	209,000	946,100	11.
	1982	3,283,200	(89,200)	—	(25,800)	—	(115,000)	—	—	0.80	43,112,000	1,347,300	—	1,016,400	2,363,700	43.0	—	447,900	358,400	1,047,600	
12. Martin Marietta Corp.	1983	3,899,258	168,935	4.3	85,600	—	141,331	3.6	4.05	1.30	34,291,000	845,356	24.0	613,541	1,458,897	42.1	9.7	162,387	211,553	1,132,226	12.
	1982	3,526,506	73,536	2.1	200	—	91,642	2.6	1.95	1.28	25,374,842	436,560	10.0	1,234,587	1,671,147	73.9	5.5	241,929	390,568	1,066,264	
13. Newmont Mining Corp.	1983	720,912	(7,907)	—	(4,877)	—	52,901	7.3	1.75	1.00	30,290,070	1,477,255	3.8	185,015	1,662,270	11.1	3.2	261,790	147,599	1,111,045	13.
	1982	674,989	(14,398)	—	(13,038)	—	48,553	7.2	1.76	1.15	27,147,632	1,320,739	3.7	189,615	1,510,354	12.6	3.2	251,410	159,944	1,100,526	
14. Olin Corp.	1983	1,934,579	95,077	4.9	23,362	—	71,715	3.7	3.01	1.23	23,984,782	848,355	8.7	387,334	1,235,689	31.3	5.8	405,139	122,580	711,864	14.
	1982	1,823,137	54,913	3.0	1,605	—	53,308	2.9	2.26	1.20	23,637,819	805,185	6.7	293,285	1,098,470	26.7	4.9	323,585	139,015	669,488	
15. Phelps Dodge Corp.	1983	977,383	46,982	4.8	(39,700)	—	(63,497)	—	—	—	24,642,950	981,029	—	600,263	1,622,582	37.0	—	132,436	59,190	756,243	15.
	1982	957,795	6,638	0.7	(32,544)	—	(74,296)	—	—	0.30	21,760,706	977,212	—	667,212	1,693,493	39.4	—	162,992	100,077	823,239	
16. Reynolds Metals Co.	1983	3,340,800	(190,000)	—	(144,400)	—	(99,100)	—	—	1.00	21,177,424	1,219,600	—	973,700	2,193,300	44.4	—	384,500	267,200	962,000	16.
	1982	2,992,400	(46,000)	—	(60,200)	4,600	7,700	—	—	1.75	19,811,167	1,373,100	—	890,600	2,263,700	39.3	—	569,600	157,500	1,085,000	

Aluminum Co. of America: Operating profit is before U.S. and foreign taxes on income and before equity earnings from entities not consolidated. Long-term debt includes long-term debt due within one year amounting to $53.4 million in 1983 and $38.8 million in 1982.

Asarco Inc.: Equity earnings of nonconsolidated associated companies was $57.9 million in 1983 and $43.6 million in 1982. Liquidation of LIFO inventories increased pre-tax earnings by $9.4 million in 1983 and $10.6 million in 1982. Proceeds from sale of tax benefits included in earnings before taxes were $10.4 million in 1983 and $9 million in 1982. Operating profit in 1983 also includes a $10 million credit from sale of a mineral prospect. Operating profit for 1982 includes an $11 million charge for estimated cost of closing three plants and liquidation of an 80 pct interest in a solar energy collector manufacturer. Extraordinary loss in 1982 reflected reserve established for entire carrying value of firm's investment in Revere Copper and Brass, Inc., and effect of an exchange of common stock for debt securities. Combined effect of the two extraordinary items was a $35.4 million loss, net of $16.9 million in deferred tax credit. Entire investment in Revere was sold in December 1982.

Brush Wellman Inc.: Operating profit is before interest expense and taxes. Net income is from continuing operations. Capital expenditures exclude mine development expenses.

Cominco Ltd.: Canadian funds. Extraordinary gain of $18.1 million in 1982 reflected sale of oil and gas properties.

Handy & Harman: Retained earnings are stated before F.A.S. #52 adjustments of ($1.286 million) and ($1.015 million) in 1983 and 1982 respectively.

Inco Ltd.: Net sales and operating revenues excludes Other Income amounting to $21.43 million in 1983 and $41.01 million in 1982. Results for 1982 are restated to reflect accounting changes made in 1983.

Martin Marietta Corp.: Net per common share figures are adjusted to reflect 3-for-2 split of common stock in October 1983. Per-share amounts assume full dilution.

Newmont Mining Corp.: Results for 1982 are restated to reflect O'okiep Copper Co. on the equity method of accounting.

Phelps Dodge Corp.: Operating profit is before depreciation, depletion, amortization and SGA expense. Funded and long-term debt includes redeemable preferred shares.

Reynolds Metals Co.: Net sales and operating revenues exclude equity income, royalty, interest and other income amounting to $47.5 million in 1983 and $66 million in 1982. Operating profit reflects reported income before taxes, extraordinary items and accounting change exclusive of Other Revenues and interest expense.

tend to other industrialized nations, but U.S. economic growth is expected to slow to a more sustainable rate and "we are concerned about the sustainability of the recovery in the face of increasingly higher interest rates and the continuing high level of Federal budget deficits in the U.S."

Mr. Reynolds said fabricated aluminum prices improved further during the first quarter but company margins still are below prerecession levels due to substantial cost increases.

He said the company expects to begin test marketing of a resealable 16-oz aluminum beverage can later this year to compete with glass and plastic bottles. Reynolds also plans to test market larger sizes next year.

Mr. Reynolds also said the "slight increase in (industry) inventories we are seeing at the present time is to be expected in a period of rapidly rising shipments and production and extended schedules. Customer inventories still are below traditional levels."

According to the Aluminum Association, the industry entered March with 2.6 million tons of inventory on hand, compared with 2.5 million tons at the start of the year. Association figures also showed the incoming order rate for the first two weeks of April were about 5 pct under the first quarter rate and 12 pct under the strong January-February showing.

Excess copper supplies begin to decline, but not fast enough

Excess copper supplies on the hedge markets continued to decline as the second quarter got underway—but not fast enough to pay off where it counts. Speculative selling late in April interrupted the gradual improvement in prices since early January and producer prices were forced to give up some of the ground won earlier.

Copper's once-reknown volatility appears to have changed to slow movement on the upside and abrupt, larger moves on the downside. Interruptions and potential interruptions to production in major copper centers have been all but ignored over the past year or so. But, as was the case late last month, traders were quick to react to early signs that demand for base metals may be slackening as the business recovery shifts into lower gear.

Copper's problem has been that it has a smaller share in consumer market growth than aluminum or zinc, but must await spillover into the capital goods sector. And, as Richard de J. Osborne, president of Asarco, Inc., noted recently, "we have not yet begun to see any pickup in demand from the capital goods sector in the U.S.—one of the most important markets for copper."

Mr. Osborne told shareholders at the Asarco annual meeting that customers in the capital goods business have indicated that their bidding activity is increasing, however, and that reactivation of previously idled plant capacity "has given rise to some pickup in demand for copper."

Asarco and other domestic copper producers wouldn't be as bad off as they are—both Asarco and Phelps Dodge Corp. reported first quarter losses, for instance—were it not for the hedge market inventories and high overseas production. Mr. Osborne noted that U.S. copper consumption last year was up about 7 pct but "all of that increase was supplied by foreign copper."

Both Asarco and Phelps Dodge blamed low copper prices mainly for the first quarter red ink. Phelps Dodge noted that hedge market stocks fell more than 20 pct from the end of 1983 to mid-April and that world inventories may be down nearly 15 pct. Asarco's Mr. Osborne noted that the drop was encouraging, but the late April retreat on the London Metal Exchange and the N.Y. Commodity Exchange suggested that stocks still are too high.

Service centers ahead of 1983's pace, see further gains this year

Service center sales nationally were running 40 pct ahead of the year-ago period in January and February and continued strong in March, said Andrew G. Sharkey, president of the Steel Service Center Institute.

With some drop in imports expected in the second quarter, supply is tightening somewhat, but this isn't a severe problem.

Service Center Steel Shipments

Thousands of Tons per Day (Flat-rolled products based on 30 pct of industry)

Sep.	**9.4**
Oct.	**9.8**
Nov.	**9.9**
Dec.	**10.5**
Jan.	**10.1**
Feb.	**10.2**
March	**10.7**

Source: SSCI

Michael Simpson, chairman of A. M. Castle & Co., added that sales nationally for service centers appear to be headed for a 15 pct gain this year. He foresees gains for the second quarter.

John Jorgensen, president of West Coast-based Earle M. Jorgensen Co., warned that shipbuilding is still "way down," but confirmed that the oilpatch buyers are coming back into the market. He sees further gains in the fourth quarter, with some new strength in aircraft industry metal buying.

New England is running strong, even though it had a relatively good year in 1983, said Richard Young, president of Congdon & Carpenter Co., based at Sekonk, Mass. "New England appears to be 30 to 35 pct ahead of a year ago and some companies are up as much as 45 pct," he said and noted that over the past decade, New England reversed a century-long downward trend.

Scrap price clarification and corrections

Effective April 24, the grade entitled "cut structural and plate, 5 ft. and under" was added to the prices reported at **Houston.**

The price reported for cut structural and plate, 5 ft. and under, effective April 24, was $95-97. The price for cut structural and plate, 2 ft. and under, effective April 24, was revised to $100-102.

At **Cleveland,** effective April 2, No. 1 dealer bundles should have been $94-97 and No. 1 factory bundles should have been $97-100. Also, at **Pittsburgh,** effective April 9 and 16, stainless 18-8 turnings should have been $500-510.

PRICE & PRODUCTION DATA

(Effective April 24, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	267	267	251	210
Buffalo	11	12	11	32
Pittsburgh	292	296	296	224
Youngstown	118	113	110	100
Cleveland	147	151	139	137
Detroit	186	178	172	139
Chicago	577	554	561	488
Cincinnati	121	118	106	98
St. Louis	85	82	85	71
Southern	233	229	234	132
Western	90	92	85	89
U.S. Production	2,127	2,092	2,050	1,720

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective April 24, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,127	2,092	31,375	23,468
Capability Utilization Rate	81.9	80.6	75.8	50.6

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.939	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 90.17	$ 90.17	$ 90.83	$ 70.83
No. 2 bundles	$ 60.83	$ 60.83	$ 61.83	$ 48.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$100.50	$100.50	$100.50	$ 75.50
No. 1 steel, Philadelphia	84.50	84.50	84.50	64.50
No. 1 steel, Chicago	85.50	85.50	87.50	72.50
No. 1 bundles, Detroit	89.50	89.50	95.50	72.50
Low Phos., Youngstown	96.50	96.50	96.50	69.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	76.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	117.50	117.50	111.50	110.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective April 24, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	74.00	74.00-75.00	4/23/84
Lead	26.00-28.00	25.00-28.00	3/29/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	53.00	51.00-53.00	3/12/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.50
Calcium, ton lots, crown	$3.50
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$387.20
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$325-$335
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$4.23
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

April 16—577.42
April 17—577.95
April 18—578.21
April 19—578.21
April 20—Holiday

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	70	60¼
Yellow brass	64	57
Red brass	66	57¾
Comm. bronze	66¾	58
Mang. bronze	65¾	57¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, dul. refinery)

No. 1 copper wire	66
No. 2 copper wire	56
Light copper	47

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	52
Light copper	43
No. 1 composition	59
No. 1 comp. turnings	57
Hvy. yellow brass solids	40
Hvy. yellow brass turnings	36
Radiators	49

Aluminum

New mixed clips	50	—51
Old sheet	49	—50
Old cast	49	—50
Clean dry borings	49	—50

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	45	—46
Mixed L.C. clips	41	—42
Old sheets and cast	36	—37
Borings and turnings	28	—29
Duraluminum clippings	28	—29

Copper and Brass

No. 1 copper wire	53	—54
No. 2 copper wire	44	—45
Light copper	38	—39
Radiators	36	—37
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	47	—48

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	115	—125
Nickel rod ends	115	—125
Nickel sheets, clips	115	—125
Nickel turnings	55	— 65

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE APRIL 24, 1984

(Effective April 24, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to	$101.00
No. 2 hvy. melting	90.00 to	91.00
No. 1 dealer bundles	118.00 to	119.00
No. 1 factory bundles (auto)	118.00 to	119.00
No. 2 bundles	59.00 to	60.00
No. 1 busheling	114.00 to	115.00
Machine shop turn.	16.00 to	17.00
Shoveling turnings	54.00 to	55.00
Cast iron borings	53.00 to	54.00
Low phos. punchings plate	119.00 to	120.00
Heavy turnings	90.00 to	91.00
No. 1 RR hvy. melting	111.00 to	112.00
Rails 2 ft. and under	120.00 to	121.00
Scrap rails, random lgth.	104.00 to	105.00
RR specialties	121.00 to	122.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	600.00 to	610.00
18-8 turnings	500.00 to	510.00

Chicago

No. 1 hvy. melting	$ 85.00 to	$ 86.00
No. 2 hvy. melting	81.00 to	82.00
No. 1 dealer bundles	112.00 to	113.00
No. 1 factory bundles (auto)	114.00 to	115.00
No. 2 dealer bundles	64.00 to	65.00
No. 1 busheling	105.00 to	106.00
Shredder scrap	104.00 to	105.00
Machine shop turn.	46.00 to	47.00
Mixed bor. and turn	47.00 to	48.00
Shoveling turnings	56.00 to	57.00
Cast iron borings	58.00 to	59.00
Low phos. forge crop	122.00 to	123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to	133.00
Low phos. 2 ft. and under	127.00 to	128.00
No. 1 RR hvy. melting	107.00 to	108.00
Scrap rails, random lgth.	107.00 to	108.00
Reroller rails	112.00 to	113.00
Rails, 2 ft. and under	126.00 to	127.00
RR couplers and knuckles	110.00 to	111.00
RR car axles	134.00 to	135.00
No. 1 machinery cast	117.00 to	118.00
Cupola cast	108.00 to	109.00
Stove plate	106.00 to	107.00
Steel car wheels	120.00 to	121.00
Stainless		
18-8 bundles and solids	550.00 to	560.00
18-8 turnings	450.00 to	460.00
430 bundles and solids	135.00 to	140.00
430 turnings	100.00 to	105.00

Philadelphia

No. 1 hvy. melting	$ 83.00 to	$ 86.00
No. 2 hvy. melting	73.00 to	76.00
No. 1 dealer bundles	104.00 to	107.00
No. 2 dealer bundles	57.00 to	60.00
No. 1 busheling	104.00 to	107.00
Shredder scrap	97.00 to	100.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	47.00 to	50.00
Low phos. 5 ft. and under	104.00 to	107.00
Low phos. 2 ft. punchings	117.00 to	120.00
Electric furnace bundles	112.00 to	115.00
RR specialties	106.00 to	109.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	70.00 to	73.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	99.00 to	102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	62.00 to	63.00
No. 1 dealer bundles	89.00 to	90.00
No. 2 bundles	44.00 to	45.00
No. 1 busheling	88.00 to	89.00
Drop forge flashings	62.00 to	63.00
Machine shop turn.	45.00 to	46.00
Mixed borings and turn.	28.00 to	29.00
Shoveling turnings	46.00 to	47.00
Cast iron borings	48.00 to	49.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	475.00 to	485.00
18-8 turnings	375.00 to	385.00
430 bundles and solids	120.00 to	130.00

Youngstown

No. 1 hvy. melting	$ 83.00 to	$ 86.00
No. 2 hvy. melting	67.00 to	70.00
No. 1 dealer bundles	98.00 to	101.00
No. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	14.00 to	17.00
Shoveling turnings	19.00 to	22.00
Low phos. plate	95.00 to	98.00
Electric furnace bundles	91.00 to	94.00
Galvanized bundles	84.00 to	87.00

Cleveland

No. 1 hvy. melting	$ 76.00 to	$ 79.00
No. 2 hvy. melting	50.00 to	53.00
No. 1 dealer bundles	94.00 to	97.00
No. 1 factory bundles	97.00 to	100.00
No. 2 bundles	30.00 to	33.00
No. 1 busheling	93.00 to	96.00
Machine shop turn.	13.00 to	16.00
Mixed bor. and turn.	13.00 to	16.00
Shoveling turnings	15.00 to	18.00
Cast iron borings	18.00 to	21.00
Cut structural & plates, 2 ft. and under	116.00 to	119.00
Low phos. punchings plate	116.00 to	119.00
Drop forge flashings	62.00 to	65.00
Foundry steel, 2 ft. & under	70.00 to	75.00
No. 1 RR hvy melting	87.00 to	90.00
Rails, 2 ft. and under	122.00 to	125.00
Rails, 18 in. and under	123.00 to	126.00
Steel axle turnings	67.00 to	70.00
Railroad cast	100.00 to	103.00
No. 1 machinery cast	107.00 to	110.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 74.00 to	$ 75.00
No. 2 hvy. melting	61.00 to	62.00
No. 1 busheling	89.00 to	90.00
No. 1 dealer bundles	89.00 to	90.00
No. 2 bundles	40.00 to	41.00
Machine shop turn.	15.00 to	16.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	20.00 to	21.00
Cast iron borings	25.00 to	26.00
Low phos. plate	102.00 to	103.00
Structural and plate, 2 ft. and under	102.00 to	103.00
Rails, 2 ft. and under	97.00 to	98.00
Scrap rails, random lgth.	77.00 to	78.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 78.00 to	$ 79.00
No. 2 hvy. melting	67.00 to	68.00
Foundry steel, 2 ft.	71.00 to	72.00
No. 1 dealer bundles	78.00 to	79.00
No. 2 bundles	65.00 to	66.00
Machine shop turn.	22.00 to	23.00
Shoveling turnings	29.00 to	30.00
Cast iron borings	38.00 to	39.00
No. 1 RR hvy. melting	84.00 to	85.00
Rails, random length	82.00 to	83.00
Rails, 18 in. and under	94.00 to	95.00
RR specialties	92.00 to	93.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	53.00 to	54.00
Stove plate	88.00 to	89.00
Cast iron car wheels	57.00 to	58.00
Rerolling rails	90.00 to	91.00
Unstripped motor blocks	61.00 to	62.00

Birmingham

No. 1 heavy melting	$ 82.00 to	$ 83.00
No. 2 heavy melting	76.00 to	77.00
No. 1 dealer bundles	82.00 to	83.00
No. 2 bundles	57.00 to	58.00
No. 1 busheling	82.00 to	83.00
Shredder scrap	104.00 to	105.00
Machine shop. turn.	41.00 to	42.00
Shoveling turnings	50.00 to	51.00
Cast iron borings	50.00 to	51.00
Electric furnace bundles	75.00 to	76.00
Elec. furnace, 3 ft. & under	80.00 to	81.00
Structural and plate, 2 ft.	108.00 to	109.00
Structural and plate, 4 ft.	102.00 to	103.00
No. 1 RR hvy. melting	102.00 to	103.00
Scrap rails, random lgth.	95.00 to	96.00
Rails, 2 ft. and under	110.00 to	111.00
Angles and splice bars	105.00 to	106.00
No. 1 cupola cast	94.00 to	95.00
Unstripped motor blocks	74.00 to	75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to	$ 71.00
No. 2 hvy. melting	64.00 to	65.00
No. 1 dealer bundles	84.00 to	85.00
No. 2 bundles	41.00 to	42.00
Machine shop turn.	10.00 to	11.00
Shoveling turnings	12.00 to	13.00
Cast iron borings	28.00 to	29.00
Low phos. 18 in. and under	102.00 to	103.00
Rails, random length	83.00 to	84.00
Rails, 2 ft. and under	98.00 to	99.00
No. 1 cupola cast	73.00 to	74.00
Heavy breakable cast	37.00 to	38.00
Drop broken cast	89.00 to	90.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	510.00 to	530.00
18-8 turnings	410.00 to	430.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to	$ 70.00
No. 2 hvy. melting	58.00 to	60.00
No. 1 dealer bundles	73.00 to	75.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	76.00 to	78.00
Shredder scrap	73.00 to	75.00
Machine shop turn.	12.00 to	14.00
Shoveling turnings	18.00 to	20.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	18.00 to	20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	83.00 to	85.00

Los Angeles

No. 1 hvy. melting	$ 48.00 to	$ 50.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	38.00 to	40.00
No. 2 dealer bundles	18.00 to	20.00
Machine shop turn.	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	77.00 to	79.00

Seattle

No. 1 hvy. melting	$ 71.00 to	$ 73.00
No. 2 hvy. melting	60.00 to	62.00
No. 2 bundles	42.00 to	44.00
No. 1 cupola cast	98.00 to	100.00
Mixed yard cast	85.00 to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 81.00 to	$ 82.00
No. 2 hvy. melting	67.00 to	68.00
No. 2 bundles	44.00 to	45.00
Machine shop turn.	18.00 to	19.00
Crushed turnings	42.00 to	43.00
Shredder scrap	83.00 to	84.00
Cut structural plate, 2 ft. and under	100.00 to	102.00
Cut structural plate, 5 ft. and under	95.00 to	97.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	80.00 to	81.00

PRODUCER KEY

With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	25.82	33.90	32.70	31.00	22.82	22.67	19.31	31.54	34.34	50.80	69.58	73.19
Baltimore	26.28	30.72	37.59	42.02	31.24	28.80	22.05	39.31	57.45	64.70	71.71	77.05
Birmingham	24.03	32.85	32.34	30.92	23.02	23.01	19.58	29.68	49.31	58.90	68.10	74.43
Boston	32.76	37.74	42.52	45.84	33.34	30.06	22.24	37.99	47.00	53.38	62.32	66.00
Buffalo	29.86	34.53	41.01	41.60	31.32	27.29	19.47	33.61	40.10	47.82	55.33	62.14
Chicago	28.82	34.02	37.41	34.32	23.12	23.38	17.46	32.68	36.51	41.03	46.46	52.27
Cincinnati	27.64	33.71	36.41	31.87	23.39	23.97	17.90	32.47	36.40	40.83	46.27	51.76
Cleveland	28.28	33.38	36.44	35.69	25.16	25.91	18.19	34.50	36.46	41.15	45.24	52.67
Denver	33.68	38.11	40.59	36.10	32.15	28.21	21.10	44.31	50.89	59.53	67.39	75.21
Detroit	28.28	34.28	37.27	33.81	24.38	26.13	14.74	32.63	36.47	40.91	46.42	54.09
Houston	33.36	34.55	38.93	44.02	30.04	27.96	23.54	42.81	47.06	54.33	59.94	67.04
Kansas City	30.56	35.85	39.74	39.49	26.35	29.79	19.72	34.68	41.69	46.71	53.11	61.14
Los Angeles	28.16	34.70	38.37	42.32	33.22	36.02	29.36	42.05	53.29	60.79	66.55	72.70
Memphis	25.34	33.05	34.52	33.57	25.93	26.17	20.00	34.00	36.78	49.96	59.80	69.44
Milwaukee	28.79	34.48	37.09	32.83	23.47	23.51	17.13	32.11	36.70	41.42	45.91	53.21
New York	30.89	37.51	42.55	46.46	32.09	27.21	21.06	41.14	46.00	51.91	61.12	68.72
Philadelphia	29.76	34.88	40.92	44.86	31.87	28.75	20.85	39.37	46.26	55.41	65.77	72.08
Pittsburgh	33.67	39.53	43.78	34.29	35.72	29.92	21.29	30.60	43.01	49.15	55.93	63.28
Portland	28.96	32.08	38.73	36.93	31.42	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	28.84	33.36	38.86	40.88	34.17	34.13	26.13	42.99	54.58	62.64	68.90	76.72
Seattle	23.94	33.41	35.11	34.23	22.24	27.32	26.14	40.05	52.66	66.22	74.14	77.49
Spokane	21.21	30.42	35.65	38.02	33.38	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	3[illegible].31	34.14	24.86	23.48	18.40	33.76	37.79	42.74	49.38	53.69
St. Paul	28.18	32.65	3[illegible].91	37.69	25.05	24.27	17.70	33.96	36.81	41.49	46.69	52.95

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$\frac{15}{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 77. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.=Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)†	
Midwest	
M2, G3, R3, W3, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)†	
S1	24.60
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	22.45
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	**per base box**
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢

**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7, I4	23.95
U1, I3, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85+CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	26.10
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRODUCER PRICES UP IN FEBRUARY

The economy continues to grow—maybe too fast, some analysts say. There is fear of overheating.

Producer prices, however, rose at only a "moderate" rate in February, according to the Bureau of Labor Statistics (BLS). They give scant indication the economy is being fueled at an unhealthy rate, according to the statistics.

The producer price index for the second month of 1984, showed a 0.4 pct increase compared with 0.6 pct in January, the BLS said.

The January rise was the steepest in 14 months. So even though the rate of increase slowed in February, prices are running at a faster pace. Prices for crude materials other than food and energy rose 0.8 pct in February after declining 3.6 pct in January.

Prices for capital equipment rose 0.5 pct after edging up 0.1 pct in January, the BLS said. Within that category, prices rose for motor trucks, truck trailers and aircraft, among others. Car prices showed no increase while light trucks were up only 0.1 pct. Those increases offset declines for office and store machines, transformers and printing trades machinery.

Without food and energy factored in, industrial prices for February increased about the same as in each of the previous three months, 0.2 pct. The indexes for passenger cars and light vehicles showed large increases after seasonal adjustment.

The index of intermediate products, used in various stages of production, was unchanged in February after seasonal adjustment. That index has inched up 0.1 pct in previous months.

The durable manufacturing materials index advanced 0.5 pct. Higher prices were registered for most nonferrous metals, steel pipes and tubes.

In a related development, industrial production rose 1.2 pct in February compared with January, according to the Federal Reserve Board. It is the second strong increase in two months.

Latest Month Covered: March 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	381.9	− 0.5	+ 2.1
Metal Forming Machine Tools	420.2	+ 0.2	+ 1.4
Agricultural Machinery & Equip.	332.7	+ 0.5	+ 2.8
Construction Machinery & Equip.	355.8	0	+ 1.8
Industrial Process Furnace & Ovens	370.6	0	+ 3.2
Industrial Material Handling Equip.	287.4	+ 0.1	+ 0.9
Pumps, Compressors & Allied Equip.	347.5	+ 0.3	− 0.2
Fluid Power Equip. (Dec. 1970 = 100)	256.9	+ 0.8	+ 1.9
Mechanical Power Transmission Equip.	322.2	+ 0.2	+ 2.4
Automobiles	222.0	0	+ 2.9
Motor Trucks—Light	281.3	+ 0.2	+ 4.4
Motor Trucks—Heavy	326.4	− 0.2	+ 2.8
Railroad Equipment	359.7	+ 0.1	+ 2.7
Fabricated Metal Structural Products	308.5	+ 0.5	+ 1.6
Electric Motors	337.9	+ 0.1	+ 4.6
Valves & Fittings (Dec. 1982 = 100)	101.1	+ 0.7	+ 1.1
Ball & Roller Bearings	336.5	+ 0.3	+ 1.6
Cutting Tools & Accessories	277.8	+ 0.3	+ 1.6
Heating Equipment	248.8	+ 0.2	+ 3.2
Plumbing Fixtures & Brass Fittings	299.9	+ 1.0	+ 5.0
Metal Containers	345.6	+ 0.2	+ 4.3
Miscellaneous Metal Products	291.7	+ 0.3	+ 4.0

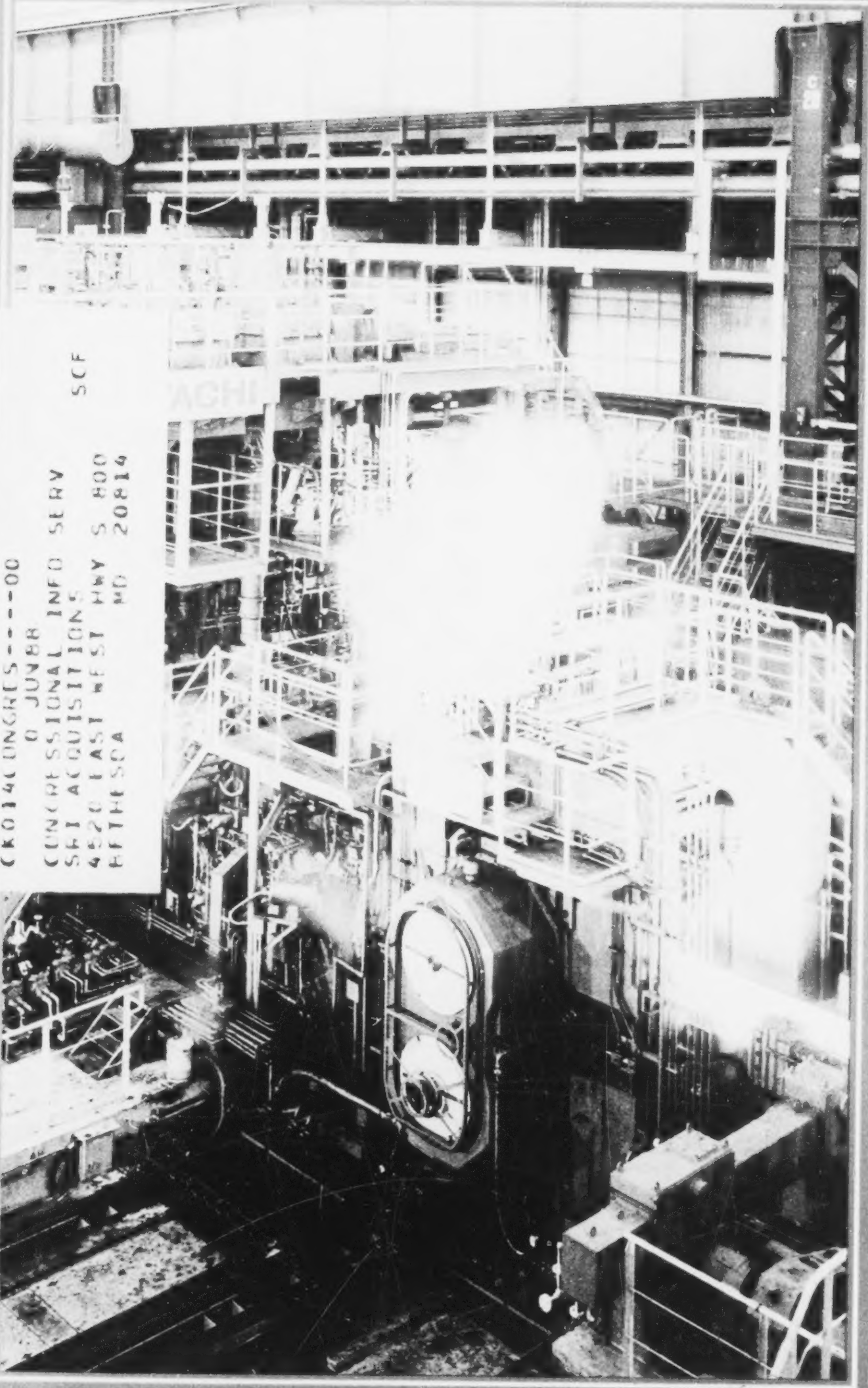
Data based on U.S. Labor Dept.'s Producer Price Index

C2150-2.7

CHILTON'S
May 21, 1984

IRONAGE

METALS PRODUCER



CR0140CONGRES---00
0 JUN88
CONGRESSIONAL INFO SERV SCF
SFT ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

A NEW GENERATION OF HOT STRIP MILLS

Annual Steel Outlook: The Questions Remain Unanswered

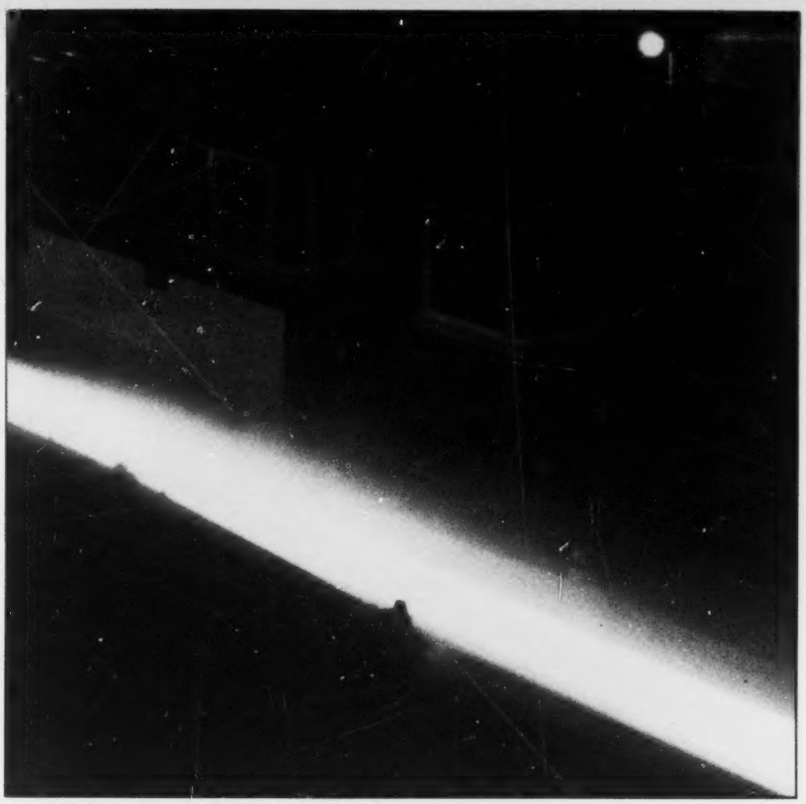
Plus
In Plant Spotlight

And
The Hot Spot

MAY 21, 1984 VOL. 227, NO. 10

CHILTON'S

IRONAGE
METALS PRODUCER



Cover: Hot strip mill, Yawata Works, Nippon Steel Corp.

Editorial 7
Where do I get off with this?

Newswatch 19
The battle over the steel quota bill is underway.

The Hot Spot 32
They overbuilt, we did not!

You and Your Job 34
Business cards can be a big deal overseas.

Steel Outlook 35
Productivity looks promising for the first half.

Hot Strip Mills 43
Three big mills came on stream in the last two years.

In-Plant Spotlight 53
KM/CAL II heat treats five different products.

First Quarter Metal Earnings 61
Steel shows life; nonferrous edges up.

Technically Speaking 69
BOF lining repaired by flame gunning.

Materials Report 89
Will the steel market take a summer vacation?

Order Trends 100
Durable orders start to slip.

Next Issue: Factory 2000.

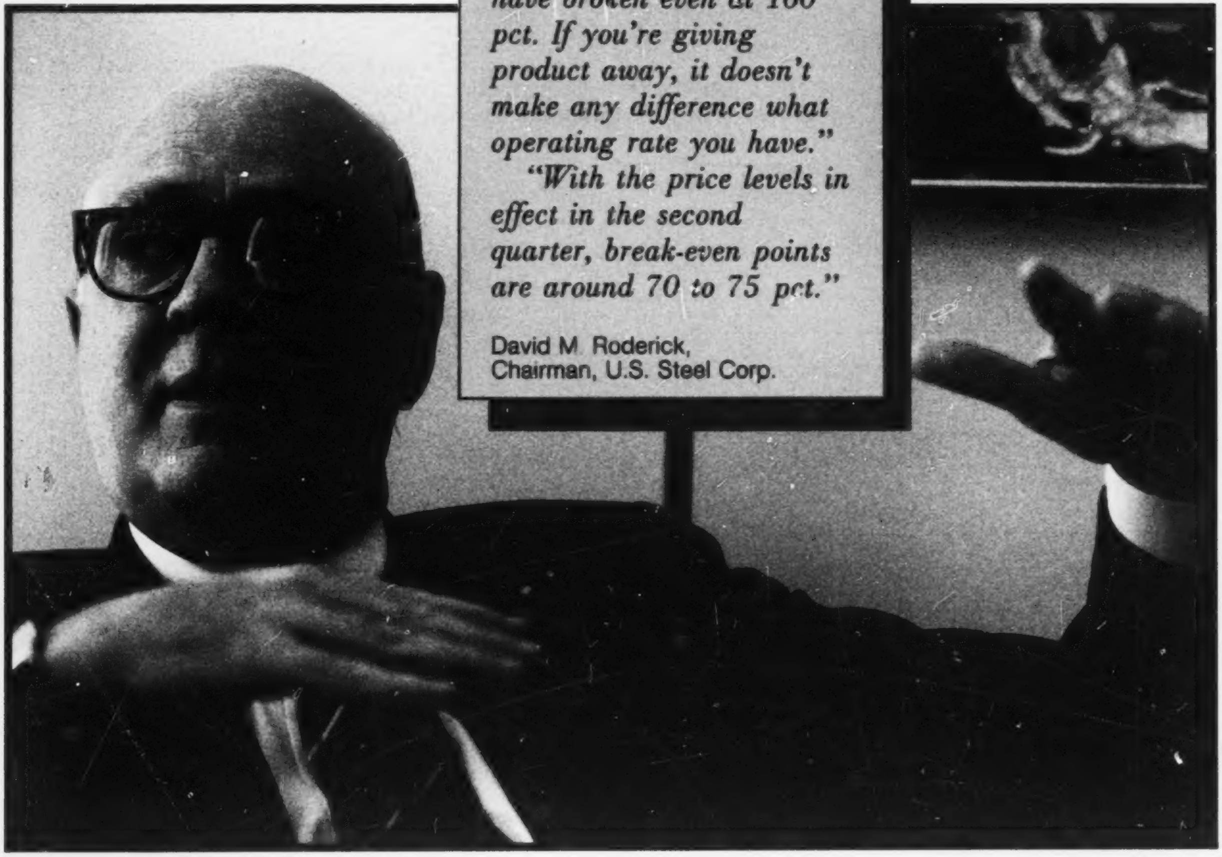
Departments

LETTERS 8
EDITORIAL STAFF 11
INDUSTRIAL BRIEFS 28
PERSONNEL TOUCH 73
PRODUCT & EQUIPMENT REVIEW 75
MANAGEMENT SERVICE CARD 91
BUSINESS STAFF 92
AD INDEX 93
P&P DATA 4/30 94
FERROUS SCRAP 4/30 96
CLEARING HOUSE 98

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

ONE OF THE ABC PUBLISHING COMPANIES

Chilton



"Last year in the third quarter, no integrated company in the U.S. could have broken even at 100 pct. If you're giving product away, it doesn't make any difference what operating rate you have."

"With the price levels in effect in the second quarter, break-even points are around 70 to 75 pct."

David M. Roderick,
Chairman, U.S. Steel Corp.

STEEL:

WILL IT EVER BE THE SAME?

Steel has emerged from the past two years battered and bruised, but not beaten. It has had to shape up. The cause of its problems are known only too well, unfavorable market conditions, unfair trade practices, technological obsolescence, labor problems and bad management. If there is one benefit to all of this the recession provided the industry with what could be regarded as deferred profits.

BY GEORGE J. MCMANUS

In the first quarter of 1984, Inland Steel Co. had a net profit of $2 million.

"It's just a notch above the breakeven point to be sure," said Frank W. Luerssen, chairman and president of Inland, "but a very welcome turnaround following nine straight quarters of deficits."

Like Inland, the whole steel industry is slowly emerging from the devastation of 1982 and 1983. Those years saw steel lose nearly $6.8 billion.

As to the causes and cures of the steel sickness, there is general agreement on one point. "...much of our problem is rooted in unfair trade practices such as dumping and foreign government subsidization," said Adolph J. Lena, chairman of AL Tech Specialty Steel Corp. and also chairman of the specialty industry joint group.

"Either we act now to address these problems or we condemn the American taxpayer to forever bear the cost of the foreign export of their unemployment to our shores," said James E. Chenault, Jr., president of Lone Star Steel Co.

Apart from subtracting 17 million tons from domestic volume in 1983 and another 6 million tons in the first quarter of 1984, imports have contributed to the collapse of domestic steel prices.

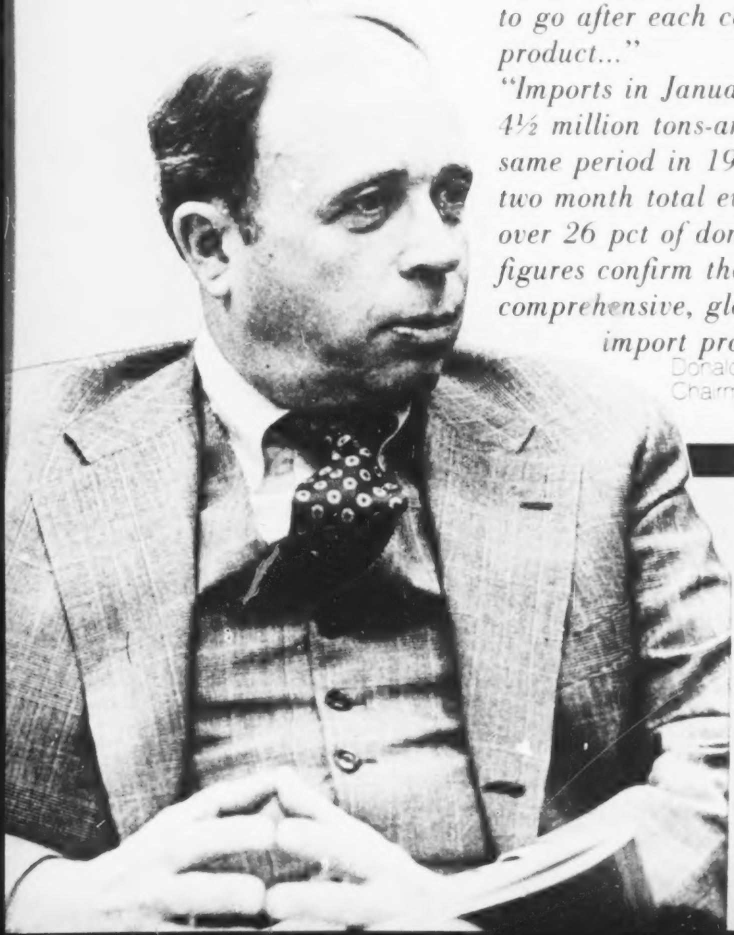
The extent of this collapse was shown in the fourth quarter of 1983 when National Intergroup, Inc., operated close to 100 pct and barely broke even on steel operations.

WILL IT EVER BE THE SAME?

STEEL INDUSTRY FORECAST 1984
How Far Will The Industry Come Back
(Thousands Of Tons)

	Total Domestic Consumption	+ Exports	Consumer Inventory + Change	− Imports	= U.S. Mill Shipments	Raw Steel Production	Steel Inventories (Million Tons)	
							Consumer	Mill
1979	113126	2818	1837	17518	100263	136341	26.74	19.10
1980	98583	4101	−3340	15491	83853	111835	23.40	16.50
1981	97082	2904	8362	19898	88450	120828	31.76	18.70
1982	85280	1842	−8892	16663	61567	74577	22.87	13.40
1983	86029	1199	−2713	17061	67454	83379	—	—
1984	92436	1245	4936	19937	78680	102110	—	—
Percent Change								
1983/82	.9	−34.9	—	2.4	9.6	11.8	—	—
1984/83	7.4	3.8	—	16.9	16.6	22.5	—	—

Source: Armco Steel



"We have neither the time nor the resources to go after each country, product by product..."

"Imports in January and February totaled 4½ million tons-an 88 pct increase over the same period in 1983. This was the largest two month total ever recorded and represents over 26 pct of domestic consumption. These figures confirm the urgent need for a comprehensive, global solution to the steel import problem."

Donald H. Trautlein
Chairman, Bethlehem Steel Corp

RAW STEEL PRODUCTION & STEEL SHIPMENTS
1976-1983

(In Thousands of Net Tons)

Year		U.S. Steel	Bethlehem	Armco	National	Republic	Inland	J&L*	Lykes*	Kaiser	Total
1976	**Raw Steel Production**	28,278	18,900	7,611	10,770	9,621	7,947	6,979	5,054	2,561	
	Steel Shipments	19,486	12,800	5,082	7,844	6,535	5,600	5,097	3,388	1,616	89,447
1977	**Raw Steel Production**	28,800	16,609	8,074	9,378	9,220	7,760	7,039	4,528	2,281	128,000
	Steel Shipments	19,700	12,405	5,633	7,621	6,657	5,586	5,381	3,391	1,588	91,147
1978	**Raw Steel Production**	31,300	18,808	8,513	10,461	9,996	8,553	7,340		2,348	125,333
	Steel Shipments	20,800	13,075	6,017	8,201	7,168	6,242	5,382		1,591	97,935
1983	**Raw Steel Production**	14,800	10,690	5,787	4,576	6,300	4,762	7,653		823	83,379
	Steel Shipments	11,300	8,740	4,324	4,034	4,846	6,306	5,811		1,054	68,000

*J&L and Lykes merged with LTV Corp.

The recession was not a happy thing for steel, but there could be some long term benefits. Viewed from a tax standpoint, the recession provided the industry with what could be regarded as deferred profits.

"Armco now has tax loss carryforwards that can shelter the next billion dollars in earnings from federal income tax," said Harry Holiday, chairman of Armco, Inc.

The recession brought a drastic pruning of facilities and people. Raw steel capacity was reduced by 25 million tons. Employment was cut from 396,000 in February of 1981 to 245,000 in February of 1984. Both hourly and salary forces were reduced 40 pct.

Along with technical moves, the rollbacks have brought decisive cost reductions. Inland has generated annual savings of over $200 million. "Moreover," said Mr. Luerssen, "a special breakeven strategy has targeted an estimated $212 million in further reductions in 1984."

Mr. Luerssen has lost none of his enthusiasm for the steel business. "...implicit in Inland's strategy is the total commitment to its basic business—steel. ...In our judgement, a company that's dedicated to the production of high quality steel products can remain a viable entity even if foreign producers continue to grab a significantly large share of the market."

Mr. Luerssen points out that diversification hasn't proved a cure-all. Armco's thinking on outside interests has changed somewhat as a result of the last two years.

"Diversification doesn't help when everything goes bad at once," said Mr. Holiday. He added that Armco still intends to have varied interests but that the mix will be different.

"Our diversification strategy now is to stick to those markets and operations we know well."

This strategy was influenced by problems in some of Armco's non-steel businesses. The company's insurance operations, which is being shed, had a pre-tax cost of $105 million in the first quarter of 1984.

U.S. STEEL

"When the first half numbers are available," said David M. Roderick, chairman of United States Steel Corp., "I think you're going to be surprised at the improvement."

Mr. Roderick said continuous casting is helping to boost efficiency but that the improvement is primarily a matter of people.

"The point is eliminating wasteful practices. What you're going to see in the U.S. is manhours per ton that are as low or lower than the Japanese and substantially lower than Europe."

Mr. Roderick cited the deep personnel cuts of U.S. Steel. "We have today in our steel operations 10,000 administrative employees," he said. "That's down about 40 pct from what it was at one time."

The financial impact of the rollbacks has been obscured by price cutting. "Last year in the third quarter, no integrated company in the U.S. could have broken even at 100 pct. If you're giving the product away, it doesn't make any difference what rate you have."

Mr. Roderick is impatient with people who discuss breakeven points without reference to prices. He indicates the steel price situation has improved somewhat since 1983.

"With the price levels in effect in the second quarter, break-even points are around 70 to 75 pct," he said. "At full book, break-even points are probably 60 to 65 pct."

"I don't see any takeover at all. I see no sinister motives or hidden agendas."
Howard M. Love
Chairman, National Intergroup, Inc.

Further cost cuts are partly a matter of unilateral action by supervisors. "They have the right under the contract to man differently than the past."

In some situations, changes in union rules are needed. "You get into 2b and you have to work with your local union and try to come up with solutions," said Mr. Roderick.

Minimills

The Steelworker international may have to involve itself in the growing problems of wage inequities. "The union has a double standard," said Mr. Roderick. "They'll organize the mini-mill and give him $12 an hour. The integrated mill making the same product has to pay $21 an hour."

Mr. Roderick looks for increased use of mini-mill technology. "The growth of the mini-mills has been a direct function of limited capital," he said. He doesn't think growth has peaked.

If the wage problem is solved, he said, "I think you're going to see integrated mills in the mini-mill business." The Steelworkers should recognize that jobs are at stake in this matter.

"The bulk of the mini-mills are non-union—probably two-thirds of them." A competitive agreement is "not a sacrifice, it's in their own self interest."

Presidential Elections

"I think Fritz Mondale does support the quota approach and will endorse the bill," said Mr. Roderick. "That's my belief and I have some basis for it.

"Clearly, the President (Mr. Reagan) is opposed to any quota legislation. He's said so."

Sen. Hart "would get people down in the oval office. I don't think he really has a position."

Mr. Roderick found it "rather humorous" that Sen. Hart's oval office approach called for the companies to reinvest income. "He doesn't seem to realize they've been doing that for years."

Another part of the Hart program was considered intriguing. "He would want a commitment from the unions—the workers—that their demands would stay within the limits of productivity..."

Imports

"Imports are a little puzzling at the moment. Obviously, they're surging in the first quarter. We see no reason the agreement with Europe is not going to hold. The Japanese historically have tended to respect a commitment once they take it on.

"The Third World—we've got a lot of cases out there. We're getting a surge in part because of those cases. You know the game everybody plays. Before the hammer strikes, they're going to make hay.

"We think imports will fall in each of the remaining quarters of the year. As our suits begin to take hold, they'll automatically cause some decline. I'm satisfied imports this year will be down slightly as a percent of our market."

Mr. Roderick spoke in mid-April just as Mexico and South Africa were announcing voluntary restraints for steel shipments to the U.S. Shortly afterward, U.S. Steel dropped its trade suits against Mexico.

"If a country wishes to take voluntary actions, I guess they have the right to do it. Then, we have to decide if the injury has been removed. As long as it's compatible with our laws, I don't object to any solution that limits the abuse to a tolerable level."

On a number of past occasions, U.S. Steel has dropped trade suits when various alternative remedies have been provided. The remedies have often proved unsatisfactory, but Mr. Roderick explains that the unfair trade suits don't offer a foolproof solution either.

"In these things, you win some and you lose some. If you don't make settlements like the European agreement, you win against four countries and you lose against three. And the three bring in more than the prior seven did."

Given the cost reductions, will domestic mills ever reach a point where foreign producers can't compete in the U.S. even with dumping and subsidies?

"We can compete right now with a good number of them on a cost basis," said Mr. Roderick. Domestic mills will never be able to compete against the kind of subsidies that have been available abroad.

"Since 1975," he said, "the European steel industry has recorded losses of over $20 billion. Governments have given them $25 billion in one way or another.

"If we had lost $20 billion since 1975, every steel company in the U.S. would be bankrupt. Did any of them disappear. Heck, No. The government made it up."

Supply & Demand

"I don't think it's going much higher but I don't think it's going a lot lower," said Mr. Roderick in mid-April of steel demand.

"We see the year as one where shipments for the second half will be slightly lower than the first half. We're saying the market for domestic producers will be about 78 million tons—almost evenly split."

Mr. Roderick looks for 1985 to be a "little stronger year.

"1982 was the most abnormal year we've had in steel since the Thirties."

While looking for better times, Mr. Roderick isn't sure the steel industry has stopped shrinking. "I don't think you can say that. It depends on how effectively we enforce our trade laws.

"How did we go from 160 to 135 million tons? Because we did not have the funds to replace the total capacity. We have capital starvation and that's been going on in this industry for 10 to 15 years."

The capacity reduction has been matched by personal cuts. U.S. Steel, for one, has had four major staff slices since the start of 1982.

"I'm not asking for more concessions. I'm saying don't take back what you've given."
Dennis J. Carney
Chairman Wheeling-Pittsburgh Steel

"We had no great plans for big reductions," said Mr. Roderick, "but everytime we see an opportunity to improve our efficiency, we're going to do it. I think you're going to see relative stability."

"I don't think we have lost one iota in our ability to produce quality products and ship quality products."

Mergers

U.S. Steel's proposed acquisition of National Steel was dropped after the Justice Department raised strong objections. "It wasn't thrown out," Mr. Roderick noted. It proved impossible to work out acceptable terms in the time available, he stated. National was unwilling to got through drawn-out negotiations and neither party was under pressure to merge.

"We don't need it for survival," said Mr. Roderick.

He has repeatedly stated that mergers are necessary if the domestic steel industry is to be restructured. Did the experience in the National case leave him with a negative view of steel?

"I don't think I'd put too much importance on that one event. We are committed to the steel industry. The Justice action can't be regarded as a long term policy. I think it was a bad decision. I don't think any of these things are irreversible."

U.S. Steel has not ruled out another steel acquisition. "If the attractiveness is there, we certainly would."

WILL IT EVER BE THE SAME?

BETHLEHEM

On Jan. 24, Bethlehem Steel Corp. and United Steelworkers of America joined in a petition which charged that domestic steel companies were being injured by imports.

Filed under Section 201 of the trade act, the petition asked that a 15 pct quota be imposed on steel imports for five years.

Section 201 cases differ from most trade actions in two ways. First, it is not necessary to show unfairness; the only question is injury. Secondly, the whole import problem is addressed; remedies such as quotas and tariffs can be applied to all products from all countries.

This last feature appealed to Donald H. Trautlein, chairman of Bethlehem Steel Corp. "We have neither the time nor the resources to go after each country, product by product...," said Mr. Trautlein.

The 201 complaint drew sharp criticism from the Reagan Administration. Bethlehem's action was "clearly contrary to the spirit of the ECC arrangement," said Commerce Secretary Malcolm Baidridge. He was referring to an agreement which limited European steel shipments to about 5 pct of the U.S. market.

The petition "placed the interests of the entire industry at risk," said Mr. Baldridge. Many domestic steel producers had misgivings on the same point. They feared the Europeans would use the 201 action as an excuse for scrapping the export ceiling.

Bethlehem argued that there was no reason for the Europeans to be upset inasmuch as the proposed quota would merely duplicate the 5 pct agreement already in effect.

In any case, said Bethlehem officials, the import problem was too serious for halfway measures. A broad remedy was urgently needed.

So far, Mr. Trautlein's strategy seems sound. The Europeans haven't junked their steel agreement. And recent statistics have documented the seriousness of the import problem.

"Imports in January and February totaled 4 1/4 million tons—an 88 pct increase over the same period in 1983," said Mr. Trautlein. "This was the largest two month total ever recorded and represents over 26 pct of domestic consumption.

Platform in D.C.

Among other things, the Section 201 petition provided steel producers with a platform in Washington. In early May, industry leaders aired their trade grievances before overflow hearings of the International Trade Commission (ITC).

This was part of a two-pronged assault. Already underway were Congressional hearings on the Fair Trade in Steel Act of 1984. Like the 201 petition, this called for a five-year quota program.

If the 201 case seemed redundant, it may not be. Whereas the legislative push can be stalled, there must be a decision on the injury petition. This is due in the early fall, only a month or two before the Presidential election.

The whole sequence established Donald Trautlein as a man with a mind of his own. Over the next two years, Mr. Trautlein's leadership qualities will be tested in addressing industry problems and those of Bethlehem.

To some extent, the problems are identical. Bethlehem is a full-line, integrated steel producer with only a minor amount of diversification. The company felt the full brunt of the industry's troubles over the past two years.

"During 1982 and 1983, Bethlehem's average annual raw steel production was only 10.6 million tons, a decline of 38 pct from the 1979-1981 average," said Mr. Trautlein. "Our average annual operating rate was only 48 pct..."

Coupled with depressed prices, the low volume resulted in a loss of more than a billion and a half dollars in two years. (There was a $1 billion writeoff in 1983). Another $54 million was lost in the first quarter of 1984.

While the deficits were largely due to external circumstances, Bethlehem isn't relying entirely on external changes for its salvation. A surprisingly large capital program includes $540 million for continuous casters at Burns Harbor and Sparrows Point.

A big push in going toward the upgrading of existing facilities. "We will spend $60 million on computers and systems hardware in 1984," said Mr. Trautlein. "When you add this to our commitment of about 1,000 systems people, we are talking about an investment of well over $100 million a year in this area."

Bethlehem is making a special effort to promote positive attitudes among hourly workers and union officials. "We've taken some of our union leaders to visit competitors' plants, both in this country and abroad...," said Mr. Trautlein.

He views the steel market with qualified optimism. "Assuming that the rate of import penetration for 1984 as a whole is reduced and that the economic recovery continues at its current pace into 1985, we continue to project domestic industry shipments of about 80 million tons."

NATIONAL

"There's a very real dichotomy there," said Howard M. Love, chairman of National Intergroup, Inc.

"The Japanese are over here talking against the quota bill," said Mr. Love. National, he added, is very much in favor of a limit on steel imports.

"We sure need some control over what's happening. We told them we were going to support the quota bill."

Mr. Love told this to Nippon Kokan of Japan. NKK is becoming 50 pct owner of National Steel Corp., the subsidiary created from the steel operation of National Intergroup. The other 50 pct will be retained by Intergroup.

The business about quotas points up the potential for conflict in a Japanese-American steel partnership. Many domestic officials are uneasy about the resolution of basic conflicts. They see NKK's move as the opening wedge that will lead to full Japanese control of National Steel and possibly other U.S. mills.

Mr. Love dismissed the idea of a big take-over. "Oh, God. No," he said. "They don't want that. They see this as an example of Japanese-American cooperation. They think this should act as a model of how two countries in the same industry can get together for the mutual benefit of both.

"I don't see any takeover at all. I see no sinister motives or hidden agendas. We've known these people for a long time. We've had technical agreements that go back 15 years."

The two owners will be equally represented on the National Steel board. National Intergroup will have the top management spots. Mr. Love will be chairman and chief executive of the steel subsidiary. Robert D. McBride will continue as president of the steel company and headquarters will stay in Pittsburgh.

A specific concern of other producers is that NKK will funnel steel through National into the U.S. market. Mr. Love is perfectly candid in saying his company is now processing some foreign material.

"We're importing a small amount of slab from Europe," he said. Specializing in sheet products, National has been operating at 100 pct of melting capacity for some time. Rather than expand, the company is supplementing its raw metal with outside purchases.

This is in keeping with long-term strategy. National will no longer expand to meet peak demand. "In 1974," said Mr. Love, "we had one good year and built a lot of capacity."

That capacity proved superfluous when demand declined in 1976 and collapsed in 1982. National has trimmed off the surplus and now intends to gear itself for average markets.

"When business is strong as it is now, said Mr. Love, "we plan to buy intermediate products from wherever we can at the best possible prices..."

This policy has nothing much to do with the NKK partnership, he indicated. Nippon Kokan won't be shipping finished steel through the new company, he said, "nor will National Steel process semi-finished products made by NKK mills in Japan."

What NKK will be shipping National are cash and technical expertise. The agreement calls for National Intergroup to receive $273 million in cash and $19 million in notes. The money will come in handy.

"It's not burning a hole in our pockets," said Mr. Love. "On the other hand, we have a strategy of attempting to diversify."

Most Attractive

NKK, which had talked to Kaiser Steel and Rouge Steel, evidently found National the most attractive U.S. mill. National is 100 pct electric furnace or oxygen steelmaking. It can continuous cast about 70 pct of its steel.

National is "one of the most modern and efficient steel companies in the United States," said M. Kanao, president of NKK.

Nippon Kokan is one of Japan's technical powerhouses. "They're a premier producer of automotive steel in Japan," said Mr. Love. He looks for NKK to provide help in increasing yields, improving surface quality and in applying process controls.

A specific area for technical assistance is electrolytic coating. National has announced a big electrogalvanizing program. Nippon Kokan has been very active in this field. With a 50 pct stake in the new company, NKK will be an equal partner and have a strong incentive to promote its success.

"We want it that way," said Mr. Love of the ownership split. "We want their full commitment, as they want ours."

NKK brings financial as well as technical strength to the party. It is Japan's second largest steel company. Sales of $6.3 billion last year were double those of National Intergroup. Financial muscle will be needed because it's estimated National Steel will be spending $800 million in the next five years.

It turns out that National and NKK had been talking about some kind of venture before National was approached by United States Steel Corp. These talks were discontinued when U.S. Steel offered to buy 100 pct of National's steel operation.

The U.S. Steel purchase fell through when the Justice Dept. raised objections. "They wanted us to give up too much," said Mr. Love. "They imposed all sorts of conditions on us."

"The U.S. Steel offer was a hell of a fine offer," he said. "But it was a traumatic thing for the management." Pulling completely out of steel would have been a wrench. "After all, most of my career has been in the steel business."

WHEELING PITTSBURGH

"You're liquidating the steel industry," said Dennis J. Carney, chairman of Wheeling-Pittsburgh Steel Corp.

The Industry isn't making enough money to sustain itself, Mr. Carney in dicated. "The most serious problem is the pricing," he said.

He noted that steelmaking capacity had fallen from 160 million tons seven years ago to 135 million tons in 1984. He predicted a further reduction to 120 million tons in 1986.

"It may go as low as 90 million tons."

Mr. Carney suggested that these numbers be pondered by steel users and steel workers.

Mr. Carney doesn't think the industry's problems will be solved by mergers—at least, not the kind of mergers that have been proposed recently. He has criticized the LTV-Republic merger.

"We have decided we will file an objection," he said. "We can file an antitrust suit. Just because the Justice Department says it's legal doesn't mean it's legal."

Mr. Carney's thinking in the merger area is complicated if not contradictory. While he indicates the steel industry has been suffering from excessive price competition, he would not favor stifling competition by combining companies.

"Competition has been good in this country," he said. In both oil and steel, he said, the combines that were broken up in the Twenties and being reconstituted. The effect will be to reduce competition.

"Ten guys in the market are more competitive than three."

Mr. Carney doesn't believe mergers will make for greater efficiency. "Big isn't better in the steel business," he said. "You're going to make small failures into big failures."

In line with this, Mr. Carney feels the liquidation of steel capacity will be confined largely to the largest mills. "The big companies are going to lose it," he said. "They have the old facilities."

Under Mr. Carney, Wheeling-Pittsburgh has certainly installed more than its share of new facilities. These included a new rail mill, a new slab caster, and a new bloom caster. "Our ability to process up to 100 pct of our raw steel through these casters is unequaled in the United States today," he told shareholders.

At the same time, he seemed concerned that his company would be squeezed by the giant new combines. "You're going to have five companies controlling 80 pct of the market," he said of the sheet business. "Where am I with 4 pct?"

Where Wheeling-Pittsburgh may be is in the position of joining the trend rather than bucking it. "They're forcing companies to do things that I don't think are right," said Mr. Carney.

His thought on foreign ties are equally complex. Nisshin Steel Co., Ltd., has acquired 9.8 pct of Wheeling-Pittsburgh common stock and will share ownership of a new coating line. "Foreign mergers are the way to go," said Mr. Carney. He is quick to add that certain kinds of foreign links are questionable.

"Foreign mergers are fine but do you want to merge Nippon Steel with U.S. Steel? We would certainly oppose that."

Wheeling-Pittsburgh may oppose the proposed joint venture of Nippon Kokan and National Steel. "Nippon Kokan produced as much steel at U.S. Steel the last two years," said Mr. Carney. If the government opposed the U.S. Steel-National merger, he suggested, it would be consistent to oppose the Nippon Kokan acquisition.

Mr. Carney's thinking on foreign ties may reflect the resentment of an overlooked party. "I really expected they would pick the small companies."

JONES & LAUGHLIN

Steel producers are facing a novel version of zero defects.

"The auto companies must have perfect steel," explained James T. Bradford, Jr., executive vice president, Jones & Laughlin Steel Corp.

If steel defects cause problems in auto plants, Mr. Bradford said, the supplier receives zero payment.

This kind of market pressure has given rise to another concept. "Some people are starting to produce super-clean steel," said Mr. Bradford.

The term, clean steel, hasn't been around that long, but it's apparently due to be displaced by super-clean steel.

Being sought, said Mr. Bradford, are levels of cleanliness measured in parts per million and thousandths of a percentage point.

"That's a tough assignment on a mass basis."

To achieve extreme purity, Mr. Bradford suggested, will take a new generation of ladle refining systems. "There's probably going to be another wave," he said. This wave will entail vacuum degassing, arc heating and sophisticated control of inclusion shape, he said.

Jim Bradford speaks with authority on steel technology. He is president of the Association of Iron & Steel Engineers.

Until a few months ago, he headed research and engineering at J&L. His promotion to executive vice president means he will play a key role in the company formed by the merger of J&L and Republic Steel Corp.

The merger takes place at a time when the steel market is demanding the best technology. "When you made sheet thick and heavy, it didn't have to be formable," said Mr. Bradford. The steel going into Model T's could be formed with a sledge hammer, he pointed out.

Today's thin auto sheets must be formable and strong. They must also have regular profiles. "As you go thinner, you need good shape," said Mr. Bradford.

As you go into electrogalvanizing, he added, you need good shape because the coating lines operating with very tight clearances. A number of the sheet mills have already announced electrolytic lines. "We're doing some engineering," said Mr. Bradford of J&L's program.

The oil country market has gone through a very abrupt quality transition.

In the glory days of the early Eighties oil companies would take any kind of seamless.

Quality Emphasis

"Today, it must be world quality," said Mr. Bradford. J&L has modernized its seamless mill in Youngstown.

Reprints available while supply lasts. For single copy, circle No. 80 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 4468

FIRST QUARTER EARNINGS

STEEL SHOWS LIFE; NONFERROUS EDGES UP

Order books and price firmness lead steel out of the woods. In the nonferrous industry, aluminum and zinc are buoyed by the consumer-led recovery. Copper, nickel and moly continue to suffer.

BY GEORGE J. MCMANUS & ROBERT REGAN

Steel

"With the steel operations now running smoothly, our order books full and prices firming, we expect substantial improvement in our business in the second quarter," said Howard M. Love, chairman of National Intergroup, Inc.

"Armco is on the road to recovery from the severe slump of the past two years," said Harry Holiday, chairman of Armco, Inc. "Provided the economic expansion continues, we expect to be profitable from continuing operations for all of 1984."

Provided the economy keeps climbing and there is no auto strike and imports subside, steel producers will probably look back on the first quarter of 1984 as a turnaround for the industry.

Thirteen out of 20 steel companies made money in the quarter. Four out of the seven largest mills were profitable. In the first quarter of 1983, all seven were in the red.

Earnings were up partly because volume was up. Steel shipments rose about 25 pct from the first quarter of 1983. Dollar sales were up the same amount, indicating steel prices had at least stopped their downward slide. There was little or no upward movement in the price trend.

"Realized prices on first quarter shipments of flat-rolled products continued to be depressed...," said Raymond A. Hay, chairman of LTV Corp.

Despite lingering price problems and volume that was only fair, the first quarter saw some dramatic profit swings. United States Steel Corp. went from a loss of $118 million in the first quarter of 1983 to a profit of $171 million in the recent quarter. The big lift for U.S. Steel came from oil and gas, which went from an operating income of $56 million last year to $363 million in the first quarter of 1984.

Steel and related resources are now lumped together by U.S. Steel. The newly-formed segment had an operating profit of $4 million in the first quarter of 1984. That was an increase from a loss of $227 million in the first quarter of 1983.

"The various cost reduction programs and other actions implemented over the past two years are producing expected results," said David M. Roderick, U.S. Steel chairman. Mr. Roderick noted that U.S. Steel's long term debt has been reduced by $1.4 billion since the acquisition of Marathon Oil in early 1982.

Bethlehem Steel Corp. had an operating loss of $39 million in the first quarter. Nearly all of this was accounted for by basic steel production. The loss was less than a third of the 1983 operating deficit, but in both years, inventory changes helped.

Bethlehem looks for the heavy end of the steel product line to benefit from rising activity in construction, machinery and energy. If markets and prices improve, "Bethlehem should return to profitability in the second quarter," said Donald H. Trautlein.

Inland Steel Co. moved into the black with a net profit of $2 million in the first quarter. That compared with a loss of $40 million in the first quarter of last year.

Somewhat surprisingly, Inland's operating profit on steel fell from $30.7 million in the fourth quarter of 1983 to $9.6 million in the first quarter of 1984. Dollar sales were down slightly from the fourth to the first quarter.

Republic Steel Corp. and LTV Corp. both lost money in the first quarter of 1984. Republic had a net loss of $36.7 million in the first quarter of 1984. That was up slightly from the first quarter of 1983, but Republic seemed to be righting itself.

"Our operating results improved progressively in each successive month of the quarter and contributed to a modest profitable result in March," said E. B. Jones, Republic chairman.

Republic shipped more than 1.4 million tons in the first quarter. The company's volume was up a full 40 pct from the first quarter of 1983. Mr. Jones noted that Republic had improved its market share over both 1983 and 1982.

LTV had a net loss of $29 million. That was down from a loss of $77 million in the first quarter of 1983. LTV's steel business had an operating loss of $27.4 million, down from $87.3 million in the first quarter of 1983.

One happy note in the first quarter picture was the $9.7 million profit of Weirton Steel Corp. So far, Weirton seems to be making a success of employee ownership.

Additional profit makers were: Cyclops which posted a $2.37 million profit compared to a loss of $2.49 million in the first quarter of 1983; Interlake with a $6.87 million profit as against a profit of $880,000 in last year's first quarter. Carpenter Technology also boosted its profits to $11.35 million from a profit of $7.28 million over last year's similar period. Further, Copperweld, Quanex, Florida, Eastmet and LaClede also posted increased earnings during the first three months of 1984.

Nonferrous

The seemingly "one-note" business recovery nudged profits and sales of

(Cont. on p. 62)

STEEL'S P/L PICTURE BRIGHTENS

1984 1ST QUARTER PROFIT REPORT (In Millions of Dollars)

	EARNINGS				SALES		
	1984 E/S	1st Quarter 1984	1st Quarter 1983	Pct Change	1st Quarter 1984	1st Quarter 1983	Pct Change
USS	3.5	$171.00	$(118.00)	—	$4,836.00	$3,864.00	+25%
BETHLEHEM	—	(54.60)	(22.50)	—	1,334.80	1,119.30	+19%
ARMCO	5.2	56.30	(128.40)	—	1,087.00	987.90	+10%
NATIONAL	1.0	7.61	(35.40)	—	774.44	777.66	−0.4%
REPUBLIC	—	(36.68)	(34.85)	—	827.45	573.49	+44%
INLAND	0.2	2.00	(19.99)	—	878.42	669.61	+31%
LTV	—	(29.00)	(77.20)	—	1,407.00	898.90	+56%
TOTAL	1.0	116.63	(436.34)	—	11,145.11	8,890.86	+25%
CYCLOPS	0.8	2.37	(2.49)	—	291.56	223.15	+31%
WEIRTON	3.4	9.68	—	—	283.13	—	—
WHEEL-PGH	—	(4.94)	(23.88)	—	258.87	172.72	+50%
INTERLAKE	2.9	6.87	0.88	+681%	236.99	197.90	+20%
KAISER**	—	(422.80)	2.70	—	227.00	391.10	−42%
CARPENTER	7.8	11.35	7.28	+56%	146.44	109.86	+33%
COPPERWELD	2.7	3.18	(5.20)	—	118.38	72.77	+63%
QUANEX	—	1.27	(4.26)	—	94.73	61.92	+53%
LUKENS	—	(2.54)	(4.47)	—	91.06	81.22	+12%
FLORIDA	5.1	3.65	(1.15)	—	71.63	58.04	+23%
EASTMET	2.3	1.62	(2.52)	—	70.29	40.93	+72%
LACLEDE	3.2	1.87	1.37	+36%	58.47	46.04	+27%

**Full Year Figures

NONFERROUS SCORES IN FIRST QUARTER

Millions of Dollars

( ) = Denotes Loss

	EARNINGS			SALES AND OTHER REVENUES		
	1st Q 1984	1st Q 1983	Pct Chg.	1st Q 1984	1st Q 1983	Pct Chg.
ALCAN	$83.0	($12.0)	—	$1,431.0	$1,245.0	+14.9
ALCOA	97.8	(14.3)	—	1,483.3	1,142.2	+29.9
AMAX	8.2	(48.7)	—	646.0	612.7	+5.4
ASARCO	(31.1)	16.2	—	398.6	352.7	+13.0
BRUSH WELLMAN	10.1	5.2	+94.2	80.6	58.1	+38.7
CABOT CORP.	25.2	21.0	+20.0	467.9	405.8	+15.3
CALLAHAN MINING	1.3	1.1	+18.2	6.4	6.7	−4.5
COMINCO	4.5	(19.0)	—	371.1	265.8	+39.6
FREEPORT MCMORAN	22.1	21.1	+4.7	202.7	204.2	−0.7
HOMESTAKE MINING	6.3	12.5	−49.6	61.7	67.7	−8.9
INCO LTD.	(35.1)	(81.9)	—	371.0	276.0	+34.4
KAISER ALUMINUM	14.6	(28.8)	—	814.1	646.3	+26.0
MARTIN MARIETTA	24.8	13.8	+79.7	1,068.0	801.9	+33.2
NEWMONT MINING	11.8	18.8	−37.2	177.6	147.3	+20.6
OLIN CORP.	27.2	22.5	+20.9	526.5	473.1	+11.3
PHELPS DODGE	(5.0)	(3.9)	—	260.3	240.9	+8.1
REVERE COPPER	13.6	(2.1)	—	158.8	121.5	+30.7
REYNOLDS METALS	22.3	(60.2)	—	944.9	746.9	+26.5
VULCAN MATERIALS	6.7	(0.03)	—	202.4	154.6	+30.9

Aluminum Co. of America: Net for the '84 period includes gains of $8.7 million from joint venture agreements and $5.3 million from a real estate transaction. **Amax Inc.:** Net for '84 period includes $7.7 million tax-loss carry-forward. **Cominco Ltd.:** Canadian funds. **Homestake Mining Co.:** Net for '83 period includes a $5.8 million write-off of a mine investment. **Kaiser Aluminum & Chemical Corp.:** Results for '83 period include $22.5 million gain from renegotiation of a natural gas contract and $22.2 million from rebate of energy charges. **Phelps Dodge Corp.:** Net loss for '84 period includes a nonrecurring gain of $25 million from settlement of litigation. **Revere Copper & Brass Inc.:** Net for '84 period includes $4,386,000 tax-loss carry-forward. **Reynolds Metals Co.:** Loss for '83 period includes $8.3 million debit cumulative effect of an accounting change on a prior period.

(Cont. on p. 67)

many leading nonferrous metals companies higher in the first quarter of 1984. The consumer-led recovery, still most evident in the automotive sector, continued to be kinder to aluminum and zinc than it was to copper, nickel, molybdenum and other metals tied too closely to capital goods markets.

The aluminum companies, in the red for the most part in the first quarter last year, were helped by higher prices and increased shipments, but profits still were below normal rates of return on sales of investment. The industry's incoming order rate shows signs of slowing up in the latter weeks of March and this continued well into April, particularly for flat rolled products, including can stock. April bookings looked to be about 12-13 pct under average first quarter business. Aluminum ingot prices on the free market continued to soften as production climbed and producers' stocks increased.

Tight production schedules weren't much help to the copper producers in the first quarter. Copper prices were down from the average for the initial 1983 period and the companies got no help from such important byproduct items as silver and gold, prices of which aren't doing any better. Speculative interest remains at a minimum because of large hedge market warehouse stocks and the lack of any signs that the consumer market boomlet has begun the spill over into capital goods. Domestic producers still are waiting to see if their bid for import quota protection is having any significant effect on production schedules in South America and Africa.

Domestic copper consumption is up, but the U.S. companies say the extra sales are going to imported material. Asarco Inc., for instance, asserted recently that foreign producers got it all last year, when U.S. consumption went up 7 pct and copper imports went up 70 pct. Asarco Chairman Ralph L. Hennebach noted that low copper prices are retarding expenditures by privately-owned producers for necessary capital improvements while government-owned producers push capacity expansion projects under umbrellas held over them by the international lending agencies.

Phelps Dodge said its wider first quarter loss reflected substantially lower copper prices and higher units costs. The company's sales of mined copper were up 6,900 tons, or 10.2 pct, to 74,600 tons. Mine production was up 17,300 tons, or 29 pct, to 76,900 tons. The company's Ajo, Ariz. mine was reopened in February 1983 and the Tyrone, N.M. mine was reopened in May 1983.

Aluminum Co. of America said higher shipments and a better product mix contributed to record sales and operating revenues in the first quarter. Charles W. Parry, chairman, said ingot prices were softening toward the end of the period, reflecting an imbalance of supply and demand and, although the company was operating its domestic smelters at virtual capacity, it had to supplement its primary output with purchases on the international market.

Mr. Parry also said the rate of economic recovery was expected to slow to a more sustainable level but the federal deficits and recent interest rate trends have generated concern about sustainability.

Alcan Aluminum Ltd.'s first quarter shipments were down slightly, but the impact was more than offset by a shift to more fabricated products and less unremunerative ingot. David M. Culver, president and chief executive officer, said recovery in ingot prices had begun to be reflected in better prices for mill products.

Reynolds Metals Co. said it looks for a nine pct gain in industry shipments this year, plus improvement in its rate of return from operating efficiencies and higher capacity utilization. Kaiser Aluminum & Chemical Corp., which also moved out of the red in the first quarter, said its aluminum operations continued to be profitable in the second quarter. The aluminum division had a pre-tax gain of $15.1 million in the first quarter, compared with a pre-tax loss of $63.7 million in the same 1983 period. Cornell C. Maier, chairman said, Kaiser Aluminum "expects to be profitable in the second half of the year, but the amount of earnings we will record depends, to a great extent, upon continued economic expansion, further improvement in both primary and fabricated aluminum prices, and better performances from our non-aluminum activities." ☐

Reprints available while supply lasts. For single copy, circle No 88 on Inquiry Card. Additional copies, $1, for articles up to eight pages. Longer ones $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write IRON AGE, Reader Service, Chilton Company, Radnor, PA 19089. Ask for Reprint No. 1015

High blood pressure. Treat it and live.

The only way to control high blood pressure is to treat it every day. Do whatever your doctor prescribes, but do it daily, no matter how you feel.

If you're on treatment, stay with it.

If you haven't started, do something about it. today.

And if you've stopped, don't be discouraged. You can get back on treatment and bring that pressure down.

High blood pressure. Treat it every day and live.

National High Blood Pressure Education Program
National Heart, Lung, and Blood Institute
U.S. Department of Health and Human Services

PRICE & PRODUCTION DATA

(Effective May 7, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	248	258	256	216
Buffalo	11	12	11	31
Pittsburgh	298	317	293	212
Youngstown	119	121	123	102
Cleveland	146	151	144	123
Detroit	177	178	178	142
Chicago	517	561	567	463
Cincinnati	109	118	126	97
St. Louis	84	89	85	72
Southern	225	235	226	141
Western	86	88	90	84
U.S. Production	2,020	2,128	2,099	1,683

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective May 7, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,020	2,128	35,523	26,879
Capability Utilization Rate	77.8	81.9	76.3	51.6

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/13/84)	26.939	26.939	26.939	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 89.50	$ 90.17	$ 90.17	$ 66.83
No. 2 bundles	$ 60.83	$ 60.83	$ 60.83	$ 46.50

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$100.50	$100.50	$100.50	$ 68.50
No. 1 steel, Philadelphia	82.50	84.50	84.50	64.50
No. 1 steel, Chicago	85.50	85.50	85.50	67.50
No. 1 bundles, Detroit	92.50	92.50	89.50	69.50
Low Phos., Youngstown	98.50	96.50	96.50	72.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	74.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	117.50	117.50	114.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective May 7, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	70.00-72.00	71.00-72.00	5/7/84
Lead	25.00-28.00	26.00-28.00	5/3/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	52.00-53.00	53.00	5/3/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$1.50
Calcium, ton lots, crown	$3.50
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$374.50
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$325-$335
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz	$8.67
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

April 30—577.42
May 1—Holiday
May 2—577.16
May 3—577.29
May 4—577.42

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	67½	63½
Yellow brass	62	60½
Red brass	63½	62
Comm. bronze	64⅛	62½
Mang. bronze	63½	55¼
Free cutting rod ends	58	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	53
Light copper	44

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	49
Light copper	40
No. 1 composition	58
No. 1 comp. turnings	56
Hvy. yellow brass solids	39
Hvy. yellow brass turnings	36
Radiators	48

Aluminum

New mixed clips	49	—50
Old sheet	47	—48
Old cast	47	—48
Clean dry borings	48	—49

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum		
Segregated clippings	45	—46
Mixed L.C. clips	41	—42
Old sheets and cast	36	—37
Borings and turnings	28	—29
Duraluminum clippings	28	—29

Copper and Brass		
No. 1 copper wire	43	—44
No. 2 copper wire	37	—38
Light copper	35	—36
Radiators	35	—36
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	46	—47

Lead		
Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel		
Nickel solids	115	—125
Nickel rod ends	115	—125
Nickel sheets, clips	115	—125
Nickel turnings	55	— 65

Zinc		
New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE MAY 7, 1984

(Effective May 7, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to	$101.00
No. 2 hvy. melting	90.00 to	91.00
No. 1 dealer bundles	118.00 to	119.00
No. 1 factory bundles (auto)	119.00 to	120.00
No. 2 bundles	59.00 to	60.00
No. 1 busheling	117.00 to	118.00
Machine shop turn.	16.00 to	17.00
Shoveling turnings	54.00 to	55.00
Cast iron borings	53.00 to	54.00
Low phos. punchings plate	119.00 to	120.00
Heavy turnings	90.00 to	91.00
No. 1 RR hvy. melting	113.00 to	114.00
Rails 2 ft. and under	125.00 to	126.00
Scrap rails, random lgth	109.00 to	110.00
RR specialties	124.00 to	125.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	600.00 to	610.00
18-8 turnings	500.00 to	510.00

Chicago

No. 1 hvy. melting	$ 85.00 to	$ 86.00
No. 2 hvy. melting	81.00 to	82.00
No. 1 dealer bundles	116.00 to	117.00
No. 1 factory bundles (auto)	116.00 to	117.00
No. 2 dealer bundles	64.00 to	65.00
No. 1 busheling	107.00 to	108.00
Shredder scrap	103.00 to	104.00
Machine shop turn.	46.00 to	47.00
Mixed bor. and turn.	47.00 to	48.00
Shoveling turnings	56.00 to	57.00
Cast iron borings	57.00 to	58.00
Low phos. forge crop	122.00 to	123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to	133.00
Low phos. 2 ft. and under	127.00 to	128.00
No. 1 RR hvy. melting	107.00 to	108.00
Scrap rails, random lgth	107.00 to	108.00
Reroller rails	112.00 to	113.00
Rails, 2 ft. and under	126.00 to	127.00
RR couplers and knuckles	110.00 to	111.00
RR car axles	134.00 to	135.00
No. 1 machinery cast	117.00 to	118.00
Cupola cast	108.00 to	109.00
Stove plate	106.00 to	107.00
Steel car wheels	120.00 to	121.00
Stainless		
18-8 bundles and solids	555.00 to	565.00
18-8 turnings	455.00 to	465.00
430 bundles and solids	135.00 to	140.00
430 turnings	100.00 to	105.00

Philadelphia

No. 1 hvy. melting	$ 81.00 to	$ 84.00
No. 2 hvy. melting	71.00 to	74.00
No. 1 dealer bundles	104.00 to	107.00
No. 2 dealer bundles	57.00 to	60.00
No. 1 busheling	104.00 to	107.00
Shredder scrap	97.00 to	100.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	47.00 to	50.00
Low phos. 5 ft. and under	104.00 to	107.00
Low phos. 2 ft. punchings	120.00 to	123.00
Electric furnace bundles	114.00 to	117.00
RR specialties	106.00 to	109.00
Rails, 2 ft. and under	120.00 to	123.00
Cupola cast	72.00 to	75.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	99.00 to	102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	62.00 to	63.00
No. 1 dealer bundles	92.00 to	93.00
No. 2 bundles	44.00 to	45.00
No. 1 busheling	91.00 to	92.00
Drop forge flashings	62.00 to	63.00
Machine shop turn.	47.00 to	48.00
Mixed borings and turn.	28.00 to	29.00
Shoveling turnings	48.00 to	49.00
Cast iron borings	46.00 to	47.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	475.00 to	485.00
18-8 turnings	375.00 to	385.00
430 bundles and solids	120.00 to	130.00

Youngstown

No. 1 hvy. melting	$ 85.00 to	$ 88.00
No. 2 hvy. melting	67.00 to	70.00
No. 1 dealer bundles	100.00 to	103.00
No. 2 dealer bundles	37.00 to	40.00
Machine shop turn.	14.00 to	17.00
Shoveling turnings	19.00 to	22.00
Low phos. plate	97.00 to	100.00
Electric furnace bundles	93.00 to	97.00
Galvanized bundles	86.00 to	89.00

Cleveland

No. 1 hvy. melting	$ 76.00 to	$ 79.00
No. 2 hvy. melting	50.00 to	53.00
No. 1 dealer bundles	97.00 to	100.00
No. 1 factory bundles	97.00 to	100.00
No. 2 bundles	30.00 to	33.00
No. 1 busheling	95.00 to	98.00
Machine shop turn.	13.00 to	16.00
Mixed bor. and turn.	13.00 to	16.00
Shoveling turnings	15.00 to	18.00
Cast iron borings	18.00 to	21.00
Cut structural & plates, 2 ft. and under	119.00 to	122.00
Low phos. punchings plate	119.00 to	122.00
Drop forge flashings	62.00 to	65.00
Foundry steel, 2 ft. & under	70.00 to	75.00
No. 1 RR hvy melting	87.00 to	90.00
Rails, 2 ft. and under	122.00 to	125.00
Rails, 18 in. and under	123.00 to	126.00
Steel axle turnings	67.00 to	70.00
Railroad cast	100.00 to	103.00
No. 1 machinery cast	109.00 to	112.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 76.00 to	$ 77.00
No. 2 hvy. melting	63.00 to	64.00
No. 1 busheling	89.00 to	90.00
No. 1 dealer bundles	89.00 to	90.00
No. 2 bundles	40.00 to	41.00
Machine shop turn.	15.00 to	16.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	20.00 to	21.00
Cast iron borings	25.00 to	26.00
Low phos. plate	102.00 to	103.00
Structural and plate, 2 ft. and under	102.00 to	103.00
Rails, 2 ft. and under	97.00 to	98.00
Scrap rails, random lgth	77.00 to	78.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 78.00 to	$ 79.00
No. 2 hvy. melting	67.00 to	68.00
Foundry steel, 2 ft.	71.00 to	72.00
No. 1 dealer bundles	78.00 to	79.00
No. 2 bundles	65.00 to	66.00
Machine shop turn.	22.00 to	23.00
Shoveling turnings	29.00 to	30.00
Cast iron borings	33.00 to	34.00
No. 1 RR hvy. melting	84.00 to	85.00
Rails, random length	82.00 to	83.00
Rails, 18 in. and under	94.00 to	95.00
RR specialties	92.00 to	93.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	53.00 to	54.00
Stove plate	88.00 to	89.00
Cast iron car wheels	57.00 to	58.00
Rerolling rails	90.00 to	91.00
Unstripped motor blocks	81.00 to	82.00

Birmingham

No. 1 heavy melting	$ 82.00 to	$ 83.00
No. 2 heavy melting	76.00 to	77.00
No. 1 dealer bundles	82.00 to	83.00
No. 2 bundles	57.00 to	58.00
No. 1 busheling	82.00 to	83.00
Shredder scrap	104.00 to	105.00
Machine shop. turn.	41.00 to	42.00
Shoveling turnings	50.00 to	51.00
Cast iron borings	50.00 to	51.00
Electric furnace bundles	75.00 to	76.00
Elec. furnace, 3 ft. & under	80.00 to	81.00
Structural and plate, 2 ft.	108.00 to	109.00
Structural and plate, 4 ft.	102.00 to	103.00
No. 1 RR hvy. melting	102.00 to	103.00
Scrap rails, random lgth	95.00 to	96.00
Rails, 2 ft. and under	110.00 to	111.00
Angles and splice bars	102.00 to	103.00
No. 1 cupola cast	94.00 to	95.00
Unstripped motor blocks	74.00 to	75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to	$ 71.00
No. 2 hvy. melting	64.00 to	65.00
No. 1 dealer bundles	84.00 to	85.00
No. 2 bundles	41.00 to	42.00
Machine shop turn.	10.00 to	11.00
Shoveling turnings	12.00 to	13.00
Cast iron borings	28.00 to	29.00
Low phos. 18 in. and under	102.00 to	103.00
Rails, random length	83.00 to	84.00
Rails, 2 ft. and under	98.00 to	99.00
No. 1 cupola cast	73.00 to	74.00
Heavy breakable cast	37.00 to	38.00
Drop broken cast	89.00 to	90.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	510.00 to	530.00
18-8 turnings	410.00 to	430.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to	$ 70.00
No. 2 hvy. melting	58.00 to	60.00
No. 1 dealer bundles	75.00 to	77.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	81.00 to	83.00
Shredder scrap	73.00 to	75.00
Machine shop turn.	14.00 to	16.00
Shoveling turnings	20.00 to	22.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	18.00 to	20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	83.00 to	85.00

Los Angeles

No. 1 hvy. melting	$ 48.00 to	$ 50.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	38.00 to	40.00
No. 2 dealer bundles	18.00 to	20.00
Machine shop turn.	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	77.00 to	79.00

Seattle

No. 1 hvy. melting	$ 71.00 to	$ 73.00
No. 2 hvy. melting	60.00 to	62.00
No. 2 bundles	42.00 to	44.00
No. 1 cupola cast	98.00 to	100.00
Mixed yard cast	85.00 to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	45.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 81.00 to	$ 82.00
No. 2 hvy. melting	67.00 to	68.00
No. 2 bundles	44.00 to	45.00
Machine shop turn.	18.00 to	19.00
Crushed turnings	42.00 to	43.00
Shredder scrap	83.00 to	84.00
Cut structural plate, 2 ft. and under	103.00 to	105.00
Cut structural plate, 5 ft. and under	95.00 to	97.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	80.00 to	81.00

DURABLE ORDERS START TO SLIP

The economy is slowing down.

Fueled by the highly variable military sector, factory goods orders moved up 2.2 pct in March compared with February, the Commerce Department said. Without the 57.5 pct increase in orders for military equipment, orders overall would have been just about the same as February.

However, broken down more finely to durable goods and non-durable, the latter including petroleum and food products, durable goods orders in March declined 1.5 pct to $22.6 billion versus $27.0 billion in February, when the military spending is removed.

Commerce Department economist Robert Ortner said the drop in durable goods spending was expected after economic activities registered a robust 6.3 pct increase in February.

New orders for durable goods totaled $104.5 billion up about 2.2 pct over February's $102.3 billion. Metalcutting machine tools orders appeared healthy, rising about 10 pct to $146.5 million compared with $133.0 million in February and $89.6 million in March 1983. Metalforming tools orders, however, dropped about 12 pct to $62.0 million from $69.9 million in February, but were still almost double March 1983's figure of $35.9 million. Overall machine tools orders were $208.4 million compared with $202.9 million the preceding month and $125.5 million a year ago.

Steel new orders dropped for the second straight month, to $4.7 billion from $4.8 billion—a 2 pct falloff.

Excluding the unchanged categories—metalworking machinery and electrical transmission equipment and industrial apparatus—14 categories were up and 10 were down.

Mr. Ortner said the economy entered the second quarter at a more moderate pace than in the first. He said the government does not view the 1.5 pct drop in nonmilitary capital goods orders as a problem.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	1st Qtr.	$332.7	$318.8	$293.0
Manufacturing, Total	1st Qtr.	124.7	116.4	109.9
Manufacturing, Durable Goods	1st Qtr.	59.2	54.9	50.7
Mining Industry	1st Qtr.	13.6	12.4	12.0
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Mar.	104.5	102.3	80.8
Shipments	Mar.	96.9	96.3	79.6
Inventories	Mar.	175.8	173.2	171.1
Unfilled Orders	Mar.	337.1	329.5	290.4
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Mar.	26.6	27.0	20.8
Capital Goods Producers, Defense Industries	Mar.	11.5	7.3	7.7
Primary Metals, Total	Mar.	11.3	11.4	8.4
Steel (SIC 331)	Mar.	4.7	4.8	3.5
Iron & Steel Castings (SIC 332)	Mar.	1.4	1.3	0.7
Nonferrous Metals	Mar.	5.2	5.3	4.2
Nonelectrical Mach.-Equip. Industries, Total	Mar.	18.2	17.2	14.9
Engines & Turbines	Mar.	1.2	1.1	0.9
Farm Machinery & Equipment (Shipments)	Mar.	0.9	1.0	0.9
Construction, Mining & Mat. Hdlg. Equip.	Mar.	2.7	2.5	1.9
General Industrial Machinery	Mar.	1.3	1.4	1.0
Fluid Power Equipment** (Index-1972=100)	Mar.	343.0	318.0	217.0
Metalworking Machinery	Mar.	0.9	0.9	0.6
Machine Tools, Total ($ Mill., Unadjusted)***	Mar.	208.4	202.9	125.5
Machine Tools, Metalcutting***	Mar.	146.5	133.0	89.6
Machine Tools, Metalforming***	Mar.	62.0	69.9	35.9
Electrical Mach. & Equip. Industries, Total	Mar.	16.7	16.1	12.5
Elec. Transmission Equip. & Ind. Apparatus	Mar.	2.0	2.0	1.6
Household Appliances	Mar.	1.4	1.3	1.2
Communication Equipment	Mar.	5.5	5.0	4.3
Transportation Equip. Industrial, Total	Mar.	28.3	26.7	19.3
Motor Vehicles & Parts (Shipments)	Mar.	15.8	16.5	10.9
Aircraft, Missiles & Parts	Mar.	11.2	7.5	7.4
Shipbuilding & Military Tanks	Mar.	0.5	1.7	0.2
Fabricated Metal Products, Total	Mar.	11.0	11.4	9.4
Instruments, Total	Mar.	4.6	4.3	3.7

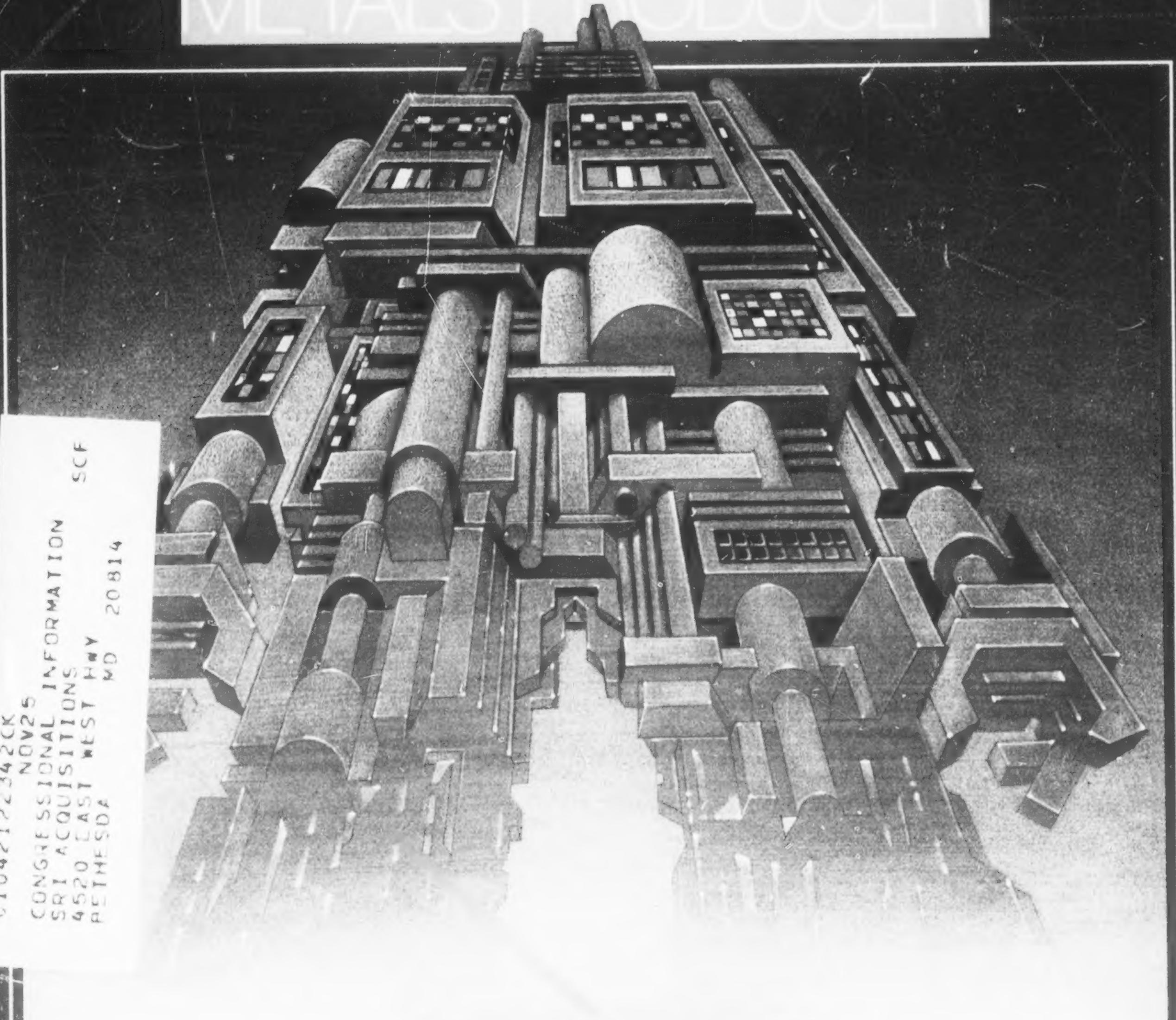
*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

CHILTON'S

IRONAGE

METALS PRODUCER

June 4, 1984



C10421223420CK
NOV25
CONGRESSIONAL INFORMATION SCF
SRI ACQUISITIONS
4520 EAST WEST HWY
BETHESDA MD 20814

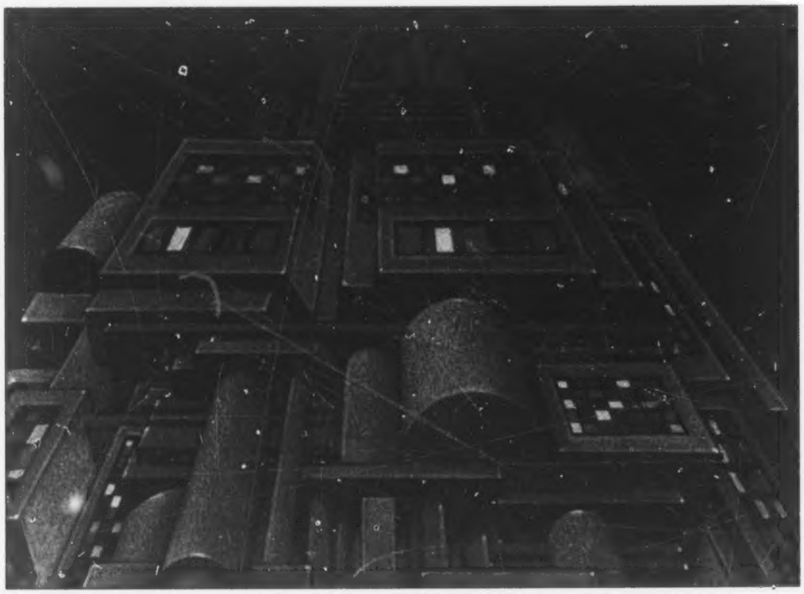
FACTORY 2000

A VISION FOR SURVIVAL IN THE 21ST CENTURY

WARNING: A COKE SHORTAGE JUST AROUND THE CORNER

JUNE 4, 1984 VOL. 227, NO. 11

CHILTON'S
IRON AGE
METALS PRODUCER



Cover: Vision of factory of the future by Randall Hamblin.

Editorial 5
Who would want that job? Well . . .

Newswatch 13
Low prices and rising costs squeeze U.S. steelmakers.

The Hot Spot 23
Why we need the 201 petition.

You and Your Job 26
Strong dollar cuts living costs for overseas execs.

Factory 2000 27
A comprehensive overview of future manufacturing.

Coke Ovens 59
Warning: A coke shortage is just around the corner.

In-Plant Spotlight 66
Modernizing in slack periods pays off.

Materials Report 73
Inventory adjustments are reducing steel demand.

Price Trends 84
Prices rise at moderate pace.

Next Issue: World Specialty Steel Outlook.

Departments

EDITORIAL STAFF 7
SIGNED, SEALED AND DELIVERED 8
PRODUCT & EQUIPMENT REVIEW 68
AD INDEX 74
MANAGEMENT SERVICE CARD 75
BUSINESS STAFF 76
P&P DATA 5/21 77
FERROUS SCRAP 5/21 78
STEEL PRICES 80
STEEL PRICES 81
CLEARING HOUSE 82

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc

LIVING OVERSEAS GETS CHEAPER

Despite overseas inflation, American companies are finding it costs less and less to support their overseas executives.

Sampling Overseas Living Costs

Assumed base salary in U.S.: $60.000	January 1983	December. 1983
Frankfurt	30,366	26,792
Rome	28,986	26,299
Madrid	26,472	23,046
Buenos Aires	20,902	22,627
Mexico City	13,236	16,982
Hong Kong	29,997	26,743
Tokyo	45,352	44,884
Sydney	27,384	25,461

Source: Global Inflation Report No. 4, April 1984
The Conference Board

BY PATRICIA S. AIMAN

That U.S. dollar may be encouraging imports, but it is also making it less costly for U.S. companies to support their executives in a number of major cities abroad.

A recent report from *The Conference Board* indicated that living costs for such basics as food, clothing and medical care (housing is excluded), declined in 1983 in 18 of 20 cities around the world, primarily because of the strength of the dollar.

The report explained that an American businessman making $60,000 a year in New York City now spends about $24,500 on living costs. But, although costs are higher in most of the foreign cities covered in the report, they actually decreased sharply in a number of major cities during 1983.

The sharpest drop was in Copenhagen, where costs fell from $31,993 to $26,102, but sharp declines were also apparent in Paris, Geneva and Caracas.

The dollar's strength was an insufficient deterrent against the 100 pct inflation jump in Mexico City or the 340 pct rise in Buenos Aires.

But, as noted by J. Frank Gaston, director of Special International Studies at the *Board*, "The dollar has gained to such an extent that it has more than offset the generally faster inflation abroad. It is very likely that the present trend will continue."

The $60,000-a-year New York City executive now working in London spends $25,757 on normal living expenses. Although inflation in the U. K. rose at an annual rate of 4.6 pct last year, the pound depreciated from $1.56 to $1.43. This means that every dollar converted at the beginning of this year was worth 9 pct more in pounds than those exchanged at the beginning of 1983.

More job recruiters on U.S. campuses

One evidence of the revival of the economy is the appearance of more and more corporate job recruiters on U.S. campuses. But, while they are dangling more offers, they are not dangling heftier salaries.

This was discovered in the *1984 Salary Survey* report from the College Placement Council, which found that starting salaries are "remaining fairly stable."

Still smarting from financial pressures, many companies wouldn't project more than 3 pct to 6 pct salary increases through this year.

Other highlights of the survey:

—Petroleum engineers drew the highest salary—$2,528 per month;

—The year may be better than expected for chemical engineers;

—Computer science recorded a major increase in job offers and a monthly salary average of $2,004, up 3.3 pct since July, 1983.

The news was good for graduate students, too, with more offers coming in, but again, starting salaries in more than half of the programs are below the closing offers in the July, 1983 survey.

Data for the survey was submitted by 187 placement offices at 162 participating colleges and universities.

Hard-to-place? This book should help

Job seekers, with two strikes against them, should read Dick Wright's book, "Hardball Job Hunting Tactics." As the director of the Job Search Workshop Program in San Mateo, Calif., he's coached more than 1,000 problem employees, claiming that more than 75 pct of his students find jobs within a few weeks of graduation.

Subject matter ranges from resume writing and filling out applications to overcoming racial prejudices and dealing with rejection. This *Work-in-America Institute* book, which sells for $11.95, provides a no-nonsense approach for single parents, welfare recipients, black teenagers, ex-offenders, the handicapped and senior citizens.

FACTORY 2000

Between now and the year 2000 the factory will change more rapidly than it has in the past 75 years. Firms will either adapt or perish.

WRITTEN BY
ROBERT E. HARVEY
DESIGNED BY
SANDY BUTRYN
ILLUSTRATED BY
RANDY HAMBLIN

The patient is dying. In this case the patient is U.S. industry and its illness is ailing productivity. That's the popular conclusion of theorists who would have us believe that nothing can be done to revive the patient. But the fact is, this illness, this slow death, if you will, need not be fatal. Cures, although often difficult to swallow, do in fact exist.

Before today's ailing factory can be transformed into tomorrow's efficient Factory 2000, healthy doses of philosophy, strategy and technology must be ingested. Recovery can begin immediately because most of the elements needed for the factory of the future are available today.

According to Thomas G. Gunn, manager, Computer Integrated Manufacturing Group, Arthur D. Little, Inc., Cambridge, Mass."We have more technology than we can implement in the next ten years."

The major technical tool, of course, is the computer, a machine with the potential to completely restructure today's manufacturing operations and launch industry into the 21st Century.

"On a global scale and by historical standard, we now find ourselves in the midst of a technological revolution on the order of the discovery of fire, the development of the water wheel, the printing press and nuclear power. This revolution will for all time change our way of life like no other change before it.... This revolution is the information revolution based on electronic miniaturization and fundamental logic," stated John R. Holland, manager, Factory Automation Laboratory, Allen-Bradley at a recent CAM-I Conference.

Factories with promising futures will be those in which management effectively harnesses this revolution. However, time is short. Computer technology is a U.S. trump card. But that card must be played soon, while it still has some value.

Rather than make effective use of this technology, however, many manufacturers are floundering amid a growing profusion of hardware, software, and computerese.

However, even more important than coming to grips with new technologies, is the need to develop philosophies and strategies that truly address the financial, human and institutional barriers that stand in the way of modernization.

The development of well-defined, long-range goals and a total commitment from upper management to pursue those goals must be the number one priority. Since manufacturing is going through so many profound changes, those firms unwilling or unprepared to move forward will not survive.

"Manufacturing will change more in the next 15 years than it has in the last 75 years," forecasted William H. Slautterback, director of manufacturing systems, Engineered Metal Products Group, Koppers Company, Inc., Baltimore, and a participant in the White House Computer Conference on Productivity. "The reasons are clear: survival and technology."

Groundwork

Dramatic change, if it is to be managed effectively, must be planned. The groundwork for Factory 2000 must be laid now. However, preparations for the factory of the future cannot be made in the dark. Some light must be thrown on what this factory is to look like, before construction plans can be made. Creating a vision of the future factory is critical. With a clear picture of where we are going, goals can be set and the steps needed to reach the goals can be formulated. Needless to say, a vision itself means little without a strong commitment by management to ensure that that vision eventually is transformed into reality.

But how to transform these visions into reality has been a concern of man from time immemorial.

A master potter bends over his wheel. The wheel spins. The clay becomes a blur beneath his hands. As the potter works, his tools, his hands, his clay, cease their separate existence. They have become but extensions of his imagination.

Because the potter's tools become extensions of himself, he is able to instantly turn his thoughts into creations. Thus, each of his pots is unique and of top quality. His extreme flexibility, his one-of-a-kind products, and his ability to instantly integrate materials, production, and management make him the antithesis of the modern mass-production-oriented, departmentally-splintered factory.

Yet Factory 2000 will in concept resemble more closely the potter than today's factory. For, say experts, in a factory at the turn of the century, the distinctions between activities will become blurred. Integration and flexibility will be pervasive, and an economic lot size of *one* will be approached.

To illustrate the relationship between present and future another way. In rural Japan, a Zen archer slowly draws back his bow, and for a timeless instant: the bowman, his bow, his arrow, and the target are one. Then, time resumes its course: the arrow hurries toward the target's center.

The Zen archer hits the bull's-eye when he becomes one with his bow and arrow and the target. Yet in today's factory, not only can't the fragmented departments be sufficiently coordinated to draw the bow properly, close teamwork would be a valueless because the target is either ill-defined or impossible to see. Companies with ill-defined or undefined targets waste much time spraying arrows skyward, hoping that one will someday strike something valuable.

Both stories illustrate dangers that can befall the manufacturer when he enlarges his operation beyond one man. Certain economies of scale are gained through growth, but in the past there has always been a cost: inflexibility and diminishing communications and control, for example. Fragmentation sets in as departments pile upon departments.

"By breaking factories into these units, we erect boxes and walls around functions which then creates enormous political problems," explained Mr. Gunn.

Splintering

Today, in large and not-so-large manufacturing companies this splintering of departments and functions has been carried to extremes. Horizontal Towers of Babel have sprung up which make communications among the design department, the manufacturing department, the finance department, the data processing department, the marketing department, and the front office, very difficult.

A engineer, who had spent much of her life in the manufacturing arena, recently was hired by an accounting firm

Roadblocks to Manufacturing Automation Efforts

Category	Percentage
Lack of Design & Engineering Staff Knowledge (& Time)	73
Lack of Inside or Outside Programming Capabilities	56
Lack of Information on Equipment & Software Capabilities	55
Lack of Machine-to-Machine Interface Capabilities	53
Lack of Central Computer or MIS Staff Knowledge	48
Lack of Mechanical Reliability	45
Lack of Suppliers to Take Entire "System" Responsibility	44
Lack of Communications Format	44
Lack of Electrical/Electronic Reliability	43
Lack of Operator or Foreman Acceptance	38
Lack of Equipment	35
Lack of Higher Management Interest	33
Lack of Outside Consultants to Assist the Effort	27
Lack of Organized Labor Support	26

Figures were obtained by a National Electrical Manufacturers Assoc. (NEMA) survey of member companies.

The percentages relate to the number of firms that indicated a particular category was "very much" or "somewhat" of a problem.

The Booming Factory Automation Marketplace

ITEM	1967	1982	1987	1995	67/82	82/87	87/95
GNP (bil $)	799.6	3059.3	4889	9755	9.4	9.8	9.0
GNP Deflator (1972=100)	79.1	207.1	274.7	418.7	6.6	5.8	5.4
GNP (bil 72$)	1011.4	1476.9	1779.5	2330	2.6	3.8	3.4
Mfg New P&E (bil $)	32.25	119.68	205	419	9.1	11.4	9.3
Mfg FRB Index	100	137.6	186	239	2.2	6.2	3.2
factory auto/000$ GNP	5.59	2.40	3.04	3.83	—	—	—
factory auto/000$ mfg P&E	138.7	61.3	72.6	89.3	—	—	—
factory auto/FRB index pt	44.7	53.3	80.0	156.4	—	—	—
Factory Automation Sales (mil$)	4472	7337	14880	37400	3.4	15.2	12.2
Mfg Computers	2603	2280	3250	5515	−0.9	7.3	6.8
Mainframes*	2541	1720	2260	3275	−2.6	5.6	4.7
Minicomputers	62	560	990	2240	15.8	12.1	10.7
CAD/CAM Systems	—	930	2800	9800	—	24.7	17.0
Machine Tools & Controls	1869	3937	7930	18085	5.1	15.0	10.9
Machine Tools	1869	3724	7100	15000	4.7	13.8	9.8
P.C	—	213	830	3085	—	31.3	17.8
Robots	neg	190	900	4000	—	36.5	20.5
Coating	—	48	180	680	—	30.3	18.1
Welding	—	52	210	800	—	32.2	18.2
Material Handling	—	40	255	880	—	44.8	16.7
Processing	—	50	255	1640	—	38.5	26.2

Source: Predicasts

which wanted some manufacturing expertise to upgrade its management support capabilities. She emphasized that the differences between the business accountant and the manufacturing engineer went well beyond simple ignorance of the other's profession. Because each spoke a very different language and thought about production and management in very different ways, it was very difficult to communicate, even at very basic levels. Industry appears to have spawned a number of divergent cultures.

The roots of this compartment approach to manufacturing are buried in history. But the persistence of industry to continue to do things the old-fashioned way can be traced to today's outdated management techniques and mediocre management—management that lacks vision and commitment.

Divide & conquer

"Traditionally, our approach to manufacturing processes has been much like the classical industrial engineering approach to problem solving. Divide the problem into small pieces and develop the best solution for each one," explained James M. Apple, Jr., senior vice president, SysteCon, Inc., Duluth, Ga. "In doing so, we presume that optimizing each element will result in total optimization of the manufacturing plant. This approach led us to solutions that represented islands of automation."

The major rationalization for the use of this classic approach came from its ability to reduce direct labor.

"However, these systems were as inflexible as they were productive. And, they are unable to adapt readily to changes in processes and market demand," Mr. Apple said. "In order to keep efficiency measures high, we made long production runs and created large inventory within the manufacturing cycle."

To react quickly to new overseas competition and a rapidly changing marketplace, firms are finding that they have to be fast on their feet. But the weight of too much inventory, too many inefficiencies, and calcified operations has begun to take its toll. Most CEOs today have financial, legal or marketing backgrounds and know too little about manufacturing and are of little use in formulating comprehensive rejuvenation strategies.

Executives are just beginning to realize that something drastic must be done, that new visions must be dreamed, that new goals must be set, that new commitments must be made.

However, before these new visions can become a reality, before Factory 2000 can be realized, four major obstacles must be overcome. The major barriers to Factory 2000, according to Mr. Holland, are financial, human, institutional, and technological ones.

Obviously, the financial obstruction is the first roadblock that must be dealt with, for without funding, nothing gets built.

FINANCIAL BARRIERS

Just as executives must be open to new ways of looking at manufacturing, they must also be open to ways to financially justify investment in the factory of the future. For instance, the purchase of an entire flexible manufacturing system (FMS) should not be justified in the same way that an individual machine tool is justified. An FMS system probably will have a significant strategic impact as well as an impact on productivity. Somehow that strategic impact must be evaluated.

"My experience has convinced me that this financial issue is causing some real problems for executives," said Frank T. Curtin, general manager, Industrial Automation Systems Dept., General Electric Co., at the March CIMCOM conference in Washington D.C. "These new technologies have a huge potential to increase productivity, but that potential is being roadblocked in many cases by the misuse of financial analysis tools. To be blunt, we are not getting off the dime because we are not sure how to calculate and measure what the return will be on investing that dime in flexible automation."

Shocking data

According to a recent Boston University School of Management survey, 78 pct of the respondents felt that, "Most businesses in the U.S. will remain so tied to traditional, quantitative investment criteria that they will be unable to realistically evaluate the potential value of computer-aided manufac-

On a global scale and by historical standard, we now find ourselves in the midst of a technological revolution on the order of the discovery of fire, development of the water wheel, the printing press and nuclear power. This revolution will for all time change our way of life like no other change before.

Corporation control will again be in the hands of manufacturing experts

1920-1950	Manufacturing
1950-1970	Marketing
1970-1985	Finance
1985-20xx	Manufacturing

Source: W. H. Slautterback, Koppers

turing options."

Using traditional investment formulas, management is confused about how to evaluate revolutionary computerized technologies. So, they are not buying them. But management is not buying systems for other reasons as well. Since most executives today come from financial, marketing, or legal backgrounds they often simply do not understand the impact of new technology. They know little about design and manufacturing and even less about computers. On top of that, they don't know who to turn to, to teach them what they ought to know.

"A key reason for the lack of top management action is these managers really don't know who to believe any more," said Mr. Gunn. "They seldom have complete trust in their own people because they are well aware of the vested interests within their own organization. They don't know which vendor to believe because the vendors have an inherent conflict of interest—especially since each vendor sees a different 'solution' to problems. Even consultants can be suspect because they may have a parochial or product-oriented point of view about something."

Buffeted by confusion, misinformation, and technological jargon, top management understandably has not thrown itself wholeheartedly into purchasing advanced equipment. Then, when companies have bought equipment, it has been for the wrong reason. Not knowing how they are going to use the equipment, (a robot for instance) but not wanting to see the technology pass them by, top management on a gut reaction, splurges on one piece of equipment. Sometimes equipment purchased in this way can have value as a learning tool. However, blindly purchasing advanced technology and then expecting it to benefit the operations is extremely naive.

If one word represents the fundamental direction of computer technology it is 'integration.' The goal of integration is to get the diverse elements in manufacturing working in harmony. The primarily tool that will bring this integration is computer-integrated manufacturing (CIM), leading eventually to the computer-integrated business, the factory of the future. Buying pieces of CIM without seeing the complete picture is just asking for trouble.

However, "Rarely do CEOs think about and plan for this kind of factory automation from a sufficiently big picture or a sufficiently high level," explained Mr. Gunn. "They use their traditional capital budgeting techniques. The result is that they have not been able to justify investing in that risky long-term factory automation program.

"They really don't have the experience to deal with factoring benefits other than direct labor reduction or increased capacity into their justification calculations. So, what often happens is that even when they do look at a total system, they think, they will go in and cherry-pick the one or two most attractive parts of that system and implement those. The other parts, not as attractive, often don't exceed whatever criteria the executive is using to justify spending. As a result, the other parts of this automation package never get implemented and the firm never gains the needed synergy available from the system as a whole."

Cost/benefit formulas

What too few executives realize is that flexible automation systems radically alter the economics of automation. "What is urgently needed are new cost/benefit formulas and measurements," emphasized Mr. Curtin of G.E.

Computers will supply the life blood for the Factory 2000

"new manufacturing economics, if you will, that go beyond the usual return-on-investment (ROI) evaluations to take into account the total impact of automation on the business. Because these technologies don't just change the factory floor. They change the entire business in new and important ways."

Those new and important ways, however, are hard to quantify. Most firms have little problem analyzing the pros and cons or automating a particular operation or machine tool. When a mixture of systems are involved, however, these firms begin to flounder. "...it is suggested that the real return from large scale automation will be incurred when it is understood that what we should be concentrating our automation efforts on is the inter-task activities which are normally ignored in terms of cost justification analysis," explained Mr. Holland. "Inter-task automation addresses the question of effectiveness as opposed to efficiency."

All the insular departments in a factory can be very effective when looked at individually but very inefficient when viewed as part of the much larger factory system. Too often integrated system solutions (where the whole is greater than the sum of its parts) are ignored because firms find they have no way of accurately determining whether the system can be economically justified. But benefits of integration are very real. Witness the separate inefficiencies but overall effectiveness of Japanese just-in-time production: In Japan, unless the work area directly ahead of a particular employee's workstation needs a part, that employee reads a book, twiddles his thumbs, or does something else with this time. His work station stays idle. The workstation, in isolation, seems inefficient. When looked at in the larger context of providing a part exactly when it is needed, the workstation becomes a very effective force in reducing work-in-process inventory.

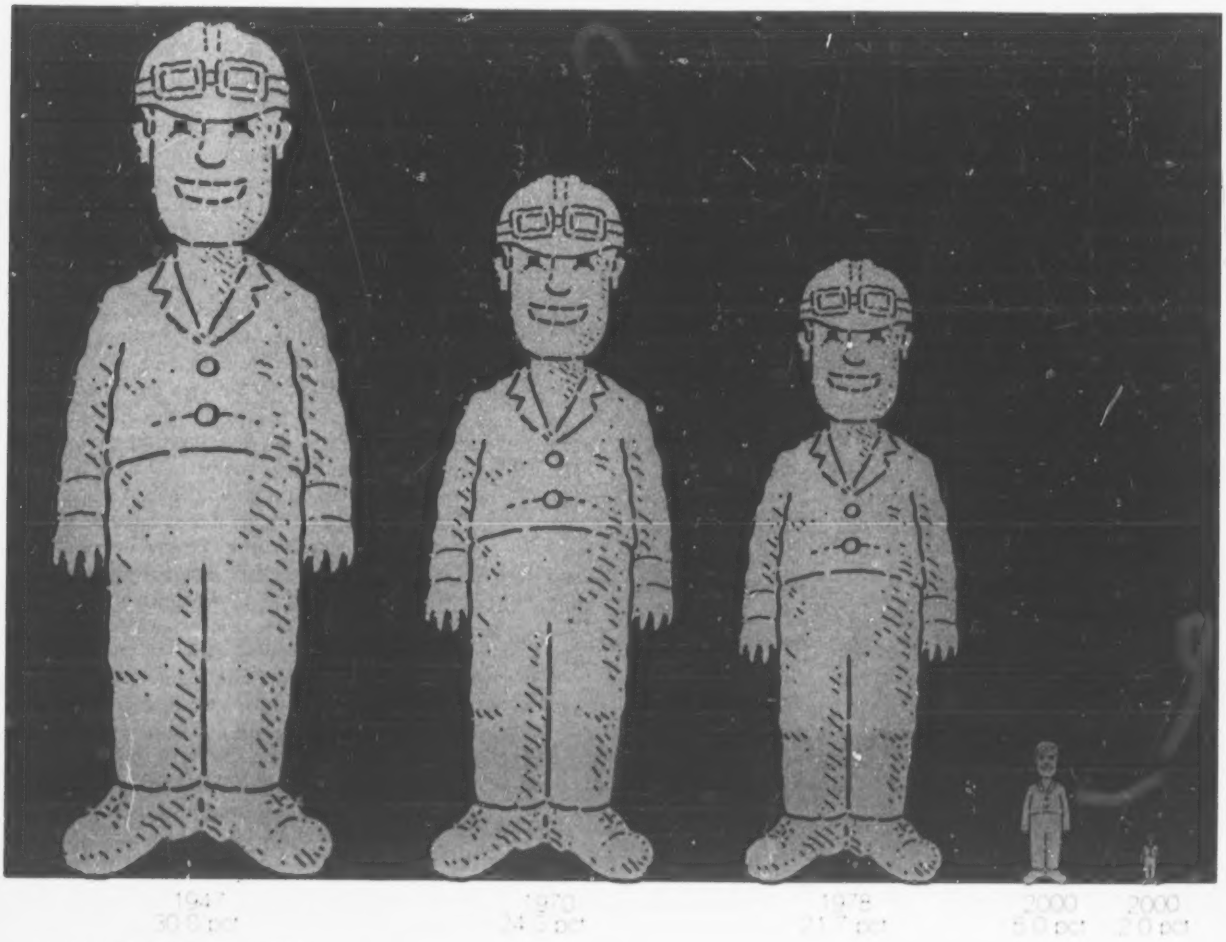
A recent Arthur D. Little report told of a Japanese manufacturer who decided to install a flexible manufacturing system. This system enabled the manufacturer to cut back the number of his machines from 68 to 18, the number of his employees from 215 to 12, and space requirements from 103,000 sq ft to 30,000 sq ft. Process time was dramatically cut from 35 days to a day-and-a-half. But the financial return over the first two years as only $6.9 million on an investment of $18 million. Now, despite the numerous strategic benefits such a plant would give a manufacturer, one the basis of conventional accounting principles, states the report, this low return on investment would be difficult if not impossible to justify.

"The point is," pointed out Mr. Curtin of G.E. "Many manufacturers continue to make the mistake of looking at flexible manufacturing system investments as tactical decisions with only short-term financial implications—when in fact they are strategic decisions with far-reaching competitive implications.

Long-term savings

"Automation provides permanent long-term savings and a host of intangible benefits...such as higher quality, shorter production runs, increased worker satisfaction, faster responses to

The Shrinking Percentage of the U.S. Manufacturing Workforce



Source: M.E. Merchant, Cincinnati Milacron changes in market demand, quicker throughput, greater flexibility and on and on."

Because manufacturers continue to focus on the efficiencies of the individual work area and ignore the big picture, major cost cutting efforts are directed at replacing a man with a machine tool or a robot. These efforts are misdirected. While direct labor accounted for a majority of product costs in the past, it does not today.

"Direct labor accounts for an average of only 10 pct of manufacturing costs, while material costs are 55 pct, indirect labor is 15 pct and overhead costs total 20 pct." said Mr. Curtin. "The big hits lie in the bigger pieces of the pie: material, inventory and overhead costs."

Once a firm decides it can financially justify an integrated system, it must next turn its attention to the people who will be manning this system. The company is now confronting the two biggest obstacles on the road to Factory 2000: the human and institutional barriers to automation.

HUMAN AND INSTITUTIONAL BARRIERS

Once the financial hurdle is negotiated, two even larger barriers in the path of Factory 2000 must be surmounted. These barriers: the human and institutional barriers are so interrelated that any discussion must address both problems together. It is humans, after all, that comprise the corporate or institutional culture.

"The lack of implementation of large scale automation is often related to human factors.... It includes a resistance to change. It involves unionism. It involves people who are 'obsolete.' " said Mr. Holland.

As well as the resistance to change, a factory culture exists that is even harder to alter. Traditionally, jobs have been done a certain way, and traditional habits are hard to break. Departments usually have operated in a particular way for so long that they have substantial inertia that must be reversed if change is to occur. But if the new vision of Factory 2000 is to be embraced, if new philosophies are to be adopted, and new strategies carried out, and if integration is to be more than a buzzword, people and departments have to change.

Communications

A major task, before operations can be integrated, is just getting departments to talk to each other.

Management information services (MIS) people have to leave their ivory tower and learn more about development and production. And as computer-aided design and computer-aided manufacturing (CAD/CAM) grows more popular, designers and manufacturing engineers will have to do more talking.

"Clearly there is a need for closer ties between our development organizations and our manufacturing organizations," stated Jim McDonald, general manager, Manufacturing Systems Prducts, IBM, "It is critical that these groups work hand-in-hand to put products out." A large gap between the two remains today. "Analyzing from a historical perspective, twenty years ago I think people came out of school knowing a lot more about how to manufacture the part that they designed than they do today. The designer needs to know how to design products that can be easily manufactured. There are tremendous training problems that need to be addressed to do that. In addition, one must continue to develop the skills of the manufacturing group so that it can provide input to the developer."

By getting the designer and manufacturer closer together, the chance of the developer designing a part that is difficult or impossible to produce is reduced. Efforts to move the two departments closer together are slow in achieving results because of the difficulty of converting the geometric information of the designer into useful information for the manufacturer as well as transforming manufacturing data into information useful to the developer. These efforts also are hindered by a corporate culture that tends to keep the to professions apart.

"There is no way that computer-integrated manufacturing will become a reality unless the people side of the scale is addressed;" emphasized Dan Ciampa, executive vice president, Rath & Strong, Inc., management consultants. "People and not technology will

Traditionally our approach to manufacturing has been much like the classical industrial approach to problem solving. Divide the problem into small pieces and develop the best solution for each one. This approach led us to solutions that represented islands of automation.

My experience has convinced me that this financial issue is causing some real problems for executives. These new technologies have a huge potential to increase productivity, but that potential is being roadblocked in many cases by the misuse of financial analysis tools.

realize the marvelous potential of CIM, but unless we become smarter about managing people, CIM will go down in history as nothing more than a good idea whose time never came."

As mentioned, technological developments have advanced so rapidly that many of the pieces for Factory 2000 are already available. "But just having a lot of sophisticated, state-of-the-art options is not going to ensure the effectiveness or efficiency we need to achieve higher quality," continued Mr. Ciampa. "The only way all of these elements can produce more effectively and efficiently is if they are integrated. Machines, computers, and software cannot be integrated unless the various departments that control and use these resources are integrated. This task is more formidable than has been the task of developing computers, software, and machinery of automation. This task must be accomplished in spite of the management philosophy and climate within most firms in this country.

"The traditional manufacturing climate discourages integration, rather than encourages it. It works against a common vision by treating people at different organizational levels in different ways. It blocks unity of purpose by encouraging outdated management philosophies and approaches."

As companies move toward Factory 2000, major changes have to occur in the way people do things. Mr. Ciampa has suggested several that will occur (see table p.47).

—As manufacturing systems become more flexible, permitting them to react quickly to changing market conditions, people will have to adjust by becoming more flexible themselves. As job content changes and broadens, people will have to acquire proficiency in several skills.

—Also, "The need for better interpersonal communication will increase as we move toward CIM," said Mr. Ciampa. "This will bring the opportunity for more face-to-face contact between people and for better communication." In addition, organizational structures will have to be changed to facilitate this need for increased communication.

—Roles and relationships will change requiring people occupying certain jobs to behave differently and to perform different tasks in those same jobs. "One opportunity of this change is to enrich and give more meaning and more challenge to jobs in the workplace. Another is to better control the decision-making process by clarifying roles and limits of authority."

—Another trend that will take place is that decision-making authority will be pushed to lower levels as equipment and systems that do more are made available on the shop floor. Being able to make more decisions and exert more control should bring greater job satisfaction to the factory floor; however, when control is moved to lower levels it must be taken from managers in higher levels. These managers could well resent this erosion of their control.

—Finally, "More involvement of the users of new equipment and systems will be necessary in determining what will be designed, and how it is to be used. The opportunity here is that new systems will better meet the needs of the people who are to use them and those people will be more committed to making them succeed," concluded Mr. Ciampa. A new system is of little value if it is not operated effectively.

Even if not planned for, the very presence of computer-integrated equipment on the shop floor will have a large effect on the way people do their jobs which will, in turn, affect the way they interact with others.

Operators

"As automation finds its way into the factory, an obvious consequence is that the operator is removed from the proximity of the machine or process. Even if the operators of machinery are not completely eliminated, they will, in general, not be as close to the machine as in the un-automated factory. As the operator backs away from the machine, the nature of his role will change from one of participating directly in the control loops at the machine level to one of supervisor and attendant," explained Mr. Holland of Allen-Bradley.

Eventually, as Factory 2000 takes shape, the operator will be entirely disengaged from the active control process. Companies that do not understand or accommodate the cultural implications of this process will eventually pay for their oversight.

With these upcoming changes in the roles and relationships of company members, it is important that top management address the potential people problems with as much concern as the technical problems. As nearly every consultant and automations expert will attest to: organizational change must begin at the top. Top executives must not only lead the way in implementing Factory 2000, they must jump into the automation effort with both feet, know what is going on, and understand the big picture. "...the CEO must describe how the company can be under CIM and in so doing paint an image of the future that is exciting and compelling. The job of creating a vision cannot be delegated," said Mr. Ciampa.

Because of the human element involved, CIM must be a step-by-step process. A manufacturer, with enough money, can plunk down $15 million for a full-blown flexible manufacturing system (FMS). But no matter what he spends, he cannot instantly enlighten the workforce. Changing a corporate culture takes time. It can take a long time: five years or more. Automation efforts which attempt to solve productivity problems in one fell swoop, which refuse to recognize the the human aspect of automation, are doomed to failure. Despite the revolutionary computer age we now live in, the implementation of computer-integrated manufacturing must be a gradual evolutionary process.

As the year 2000 approaches, the hierarchy in a manufacturing operation will be much different than it is today. With each employee assuming more control of his/her operations, fewer layers of management will be needed. In addition, the relationship between the various layers will be much less formal than today. This informality will grow as the management content of employee jobs increases and the envolvement of top management in manufacturing grows.

"In addition to various departments being integrated in this effort, there needs to be a new partnership between salaried and hourly workers," explained Mr. Ciampa. "We all recognize that CIM means enormous changes on the shop floor—and those changes cannot be successful unless the direct labor workforce is committed to success. They must feel involved and that means that they must participate in determining how CIM will take shape in their company. In order for this to happen, the traditional adversary relationship between management and labor must change. It is dysfunctional and wasteful."

Mr. Ciampa suggested that for labor to be more cooperative it needs a bigger piece of the action, "....emotionally through influencing outcomes and financially through plans such as gainsharing." Before Factory 2000 can become a reality, both management and labor are going to have to reassess their positions.

Education

If the corporate cultures are going to change and employees are going to be assigned new jobs, education will be playing an increasingly important role in tomorrow's factory.

Today there is a need to see beyond barriers, to understand the interconnecting of various disciplines. People like systems engineers will be in increasing demand. Today's systems encompass a wide variety of technologies such as electronics, mechanics, hydraulics, computers and computer programming, and laser optics to name a few.

But do the generalists who are cross-trained in many disciplines exist today?

"If I was asked that question two of three years ago if schools teaching this kind of education existed, I would have said no," responded Jim McDonald of IBM. "However a number of schools are starting to put together some excellent programs in the area of manufacturing systems engineering and many schools that do not yet have the programs are interested in starting them."

Not only will technical people with new skills be needed, people with new human relations skills will be called upon to interact with the employee of the future. Today's personnel departments are a far cry from the human resources departments soon to be needed.

"One of the biggest challenges will be to find and to develop managers and

There is no way that computer integrated manufacturing will become a reality unless the people side of the scale is addressed. Unless we become smarter about managing people, CIM will go down in history as nothing more than a good idea whose time never came.

Regarding standards it is time for all of us to work harder than ever to put aside short-term tactical advantages and proceed to develop the communications, electrical interfaces to allow the user to buy American. We cannot become the standard for excellence if we are non-standard.

supervisors who can make the most of the technology that is being made available. This will require defining the areas of competence needed of managers and supervisors in the era of CIM. Further they will be responsible for developing training programs geared to raising people's knowledge, skills, and behavior so that they can perform at that level," said Mr. Ciampa. "We should look to a new breed of human resources professional to help."

The final barrier to automation that has to be addressed is a technological logical one. However, the problem is not primarily a lack of necessary technology but the inability to integrate, to connect, this technology together.

TECHNOLOGICAL BARRIERS

Technology shapes the building blocks of Factory 2000. The specific building blocks will be discussed later.

When taken as individual building blocks or parts to the factory automation puzzle, many of the pieces of that puzzle have already been developed. The main problem is not that there are not enough pieces but that the pieces don't yet fit together.

It is not the case of just a minor adjustment here and there. It is very difficult to get any two pieces of factory equipment to talk together unless they have been made by the same vendor.

What is needed are standard ways of linking equipment so they can communicate. A manufacturer ought to be able to easily attach a programmable controller with a minicomputer and a robot and have them talk back and forth. But right now this task is next to impossible.

"Regarding standards, it is time for all of us to work harder than ever to put aside short-term tactical advantages and proceed to develop the communications, electrical interface, and software interfaces to allow the user to buy American." said Mr. Holland. "We cannot become the standard for excellence if we are non-standard."

General Motors

The Company that is leading the way in standards development is General Motors. The firm is working with control manufacturers and national and international standards committees to produce a set of standards that suppliers must adhere to if they are to sell to GM. The hope is that once GM defines and adopts these standards, other firms will begin to accept the same standards for their companies.

"Productivity improvements within General Motors manufacturing generally began with the automated control of single processes such as machines, conveyors and product test stands," said Ron Floyd, who is with the advanced product and manufacturing engineering staff at the General Motors Technical Center. Over time this automated control has expanded to a functional orientation, with a control or supervisory system encompassing an entire function such as material handling or an engine head line."

Presently, GM uses approximately 20,000 programmable devices within manufacturing with projected quantities to reach 40,000 in two years. The benefits obtained from increased manufacturing automation associated with these devices is substantial.

"A major step remains to be taken however: the move from automated functions and processes to the computer-integrated 'Factory of the Future,' " said Mr. Floyd. "The factory of the future concept requires integration of separate automated processes into a sophisticated, cohesive whole. Timely information must be available for exchange between automation centers and presentation to management. This information will enable timely and accurate decisions—implemented online, for optimized manufacturing. Data communication among automated processes in some cases is not practically possible. In other cases, skilled data processing professionals are required to implement custom interconnections."

The solution to the data communications incompatibility problem at GM is establishment of standards. GM would like to set up communications networks and be able to attach equipment on that net. Today, however, vendors cannot use a common network because each vendor supplies a unique protocol which either cannot be emulated by other manufacturers or can be only at great expense.

"The lack of compatible communications hardware and software results from the lack of viable networking standards," explained Mr. Floyd."To date, computer manufacturers have generally invented their own communications protocols, many of which are proprietary. Within a facility where several computer manufacturers are used, the result is incompatibility. The need for the establishment of viable standards is here today within manufacturing. Just as important, we need wide vendor support of such standards with cost effective and compatible data communication products."

Although they still must be linked together, a lot of advanced technology is already on the market, ready to be incorporated into tomorrow's automated factory. A look at what some of this is and how it will develop over the next decade-and-a-half is is order.

PIECES OF THE PUZZLE

Moving toward Factory 2000 is not just surmounting barriers it is also assembling elements. Many of the parts for that factory, be they strategic equipment, software packages or pieces of hardware, are available today. As important as these elements are, they must be integrated into systems before their potential truly can be realized.

The goal is the creation of computer-integrated manufacturing or CIM. CIM provides the blueprint which designates how the diverse parts of the factory of the future will be linked together. "...CIM is a corporate strategy—nothing more, nothing less," explained Charles M. Stata, Manager, New Venture Technology, Wang Laboratories Inc., Lowell, Mass. at the 1984 CIMCOM Conference. "...CIM is not a new software system. It is not hardware. It is not a product which you can go out and buy off the shelf."

While hardware and software are essential to implement the technology, CIM is is a way of doing business, not a pile of equipment. "CIM starts with a mindset," he continued, "which dominates the selection of equipment, the choice of software approaches, and most importantly, how we think of our business' growth."

Defined by Mr. Stata, "CIM is the methodology for automating the gathering and sharing of information among computer systems to establish a closed loop in-time feedback system for effective planning and control."

By accepting CIM as a legitimate strategy, manufacturers are beginning to recognize that the chief business of manufacturing is the gathering and manipulation of information. In today's factory much more time and effort is spent collecting and analyzing geometric and alphanumeric data (letters and numbers) than ever is spent in actual metalworking.

CIM recognizes that the success of tomorrow's factory depends on its ability to gather and share data. If data is so important, it becomes critical that a corporation "adopt a set of rules which will govern the time frame, data forms and interconnections used in the collection, storage and sharing of data among the authorized applications and users," said Mr. Stata. "Data, then, becomes a controlled corporate resource rather than an application dominated entity."

If information is such a valuable commodity, the ability to transfer the correct information to whoever needs it, becomes an important task. Building a comprehensive pipeline that carries data to all parts of the company (and even outside the company to vendors and suppliers) is a major goal for CIM users. A company's information architecture describes the shape of this data pipeline. But improving a firm's data architecture is half the problem, for once the data gets to where it is supposed to be going, it must arrive in some form that can be used and understood. The information also should arrive when it is needed. All these problems regarding where, when and how data is to be sent are being addressed by the CIM concept.

"Now, if you don't consider the data architecture as most factories don't today, you will buy a component or system that is justified on its own merits and will paint yourself into a concrete

CIM Will Bring Major Changes to Employees

Change	Opportunities	Dangers
Job Content Change	More Growth Opportunities	More Unemployment Worker Discontent
Better Interpersonal Communication	More Face-To-Face Contact Better Working Relationships	Worse Working Relationships
Roles And Relationships Change	Enrich Jobs and Offer More Challenge and Satisfaction Better Control Decisions	More Decisions Not Made More Confusion People Not Able to Adapt
Decision-Making Authority Pushed Down	Greater Motivation Faster Decisions	Threatening Vertical Checks and Balances
More User Involvement	Better Meet Needs More Commitment	Longer Development Time Complicate the Process

Source: Dan Ciampa, Rath & Strong, Inc.

corner when you want to automate up to the next level," cautioned Malcolm L. MacFarlane, vice president, Gartner Group Inc. "At this next level where you have to attach two systems together, you will find those systems mutually incompatible."

Developing a unified architecture that that takes into account how data is structured in a particular company is an important aspect of CIM. Also important is knowing what form the data is in as it travels through the pipeline.

"The data which is collected, stored,

The factory of tomorrow begins with an exciting collective vision.

computed and reported resides in the computer in a form which most of us have little knowledge of," explained Mr. Stata. "Yet I submit that this is the single largest element which needs close control. Traditionally, we, the users, have not cared how the programmers coded the part number. With an integrated environment, you need to care because you want to share between previously isolated systems. Across your business a part number should be represented commonly so that all of your systems will recognize the part number the same."

According to Mr. Stata, CIM has three identifiable characteristics. The first is automated information gathering, which means information is collected by a computer not a piece of paper. The second characteristic is net working, which allows the transfer of data between systems, and the last characteristic is the shared data base.

A data base is simply the systematic organization of data files for easy access, retrieval and update. Information within a data base is not tied to a particular program but can be accessed when needed by all types specific application programs.

CIM is made up of a number of subsystems and and technologies. Some of the most important include computer-aided design and computer-aided manufacturing systems (CAD/CAM). Computer-aided process planning (CAPP), computer-aided quality inspection, robots, numerically controlled machine tools (CNC/DNC), automated materials handling, manufacturing resource planning (MRP), group technology, laser systems, flexible manufacturing systems (FMS), and manufacturing cells. In the future, artificial intelligence (AI) will be an important part of CIM.

Key ingredient

The one indispensable element in CIM is the computer itself and its accompanying software. "Clearly, computers will become smaller, more powerful, less expensive, and will therefore see increasing use. In tomorrow's factory, standards will create compatibility between computer brands as well as with other intelligent technologies. In fact, the computer will be a tool, just as a hammer is to a carpenter; the brand name will be insignificant as long as the tool is functional and reliable." predicted Mr. Slautterback of Koppers.

Computer keyboards will probably be replaced to a large extent by touch screens and audio commands. The use of voice commands for a computer, however, present problems. It would be difficult for a manager on the shop floor to yell a command to one computer, without having another respond to that command, for voice cannot be directed to only one particular spot.

In CIM the hardware is only as good as the software that runs it and software continues to improve the computer's capabilities.

"If you look at software as having reach—that is, having the ability to reach in front of itself and in back of itself and understand what is going on, new developments are occurring that are designed to give software that extra reach," explained Ray L. Dicasali, vice president, Manufacturing Systems Div., Management Science America, Inc. (MSA). "One of the main complaints of manufacturers is that they do not get good forecasts from marketing. As a result, the factory sets up its schedules and then must change them at the last minute. We want our manufacturing resource planning (MRP) system to reach out to a customer's order management system."

By extending the reach of software beyond the loading dock and into the marketplace, manufacturing people now have an early warning system, which warns them much sooner that changes are coming.

Software is reaching into other areas as well. "Another complaint from manufacturing people is that engineering changes come through at inopportune times. Quite often engineering changes are coming through either because there is an improvement that is needed, or a part that used to be available isn't. You have to make substitutions, but these last minute production changes hurt productivity," explained Mr. Dicasali. "We think that the reach of the manufacturing materials system should be back into the engineering data base to provide early warning of an engineering change."

A third area that software is reaching into is the financial and cash management areas.

Functional integration is another direction of software development. Briefly, this means that software applications are not only integrated physically but it is also integrated logically. This means that a manufacturing software system, for example, would know its particular role and how it effected other systems down the line.

Software advances

Some of the trends in software development, according to Kenneth A. Fox, vice president, research and development, ASK Computer Systems Inc., Los Altos, Calif., include the growing use of modular software which allow manufacturers to build toward the factory of the future step by step.
Modules from ASK include MRP, shop floor control, inventory, work-in-process, purchasing, capacity and resource planning and has also added accounting packages, field service, payroll, and human resources. Linked together the modules form what is called an interactive, real time system.

"I think a major trend is the move toward standard software products (in the past, big software users developed much of their software internally). I think that this standardization must occur before these computer-integrated manufacturing technologies can be cost-effectively purchased by the average manufacturer," said Mr. Fox.

In the future most companies will use purchased software packages, but where unique or proprietary software will be needed, natural languages will exist that will allow an individual with no knowledge of programming languages to create his own software.

"Also," said Mr. Fox, "I see the need for systems like ours to be connected to many more diverse kinds of equipment for improved data collection. Today input really comes mostly from user interaction with a terminal, but there are lots of more specialized types of data collection equipment: bar code readers, for example."

Besides computer hardware and software, the next essential element of Factory 2000 is a flexible manufacturing system. FMS, which has been defined by Mr. Slautterback as the orderly, systematic arrangement of equipment (primarily machine tools, robots, measuring systems, and material handlers) to perform manufacturing operations on a group of similar parts, under computer control, without human intervention.

While there are about 30 true FMS systems in the U.S. at present, Mr. Slatterback predicted that there will be over 10,000 by the year 2000. "The logical progression from NC to CNC, to FMS, to the Unmanned Factory is in process," he stated.

The great value of FMS is that it is flexible and automated. A system can handle one type of part or a random group of related parts with equal ease. It can also run unattended for long periods of time.

The main components of an FMS are machine tools. A major problem with machine tools today and one that hinders their efficient usage in FMS systems is tool ware and breakage. In an automated system, no one is around to change a broken tool. As time goes on however, "The concern about tool wear and breakage will be reduced by using such techniques as energy beams and electrical discharge," predicted Mr. Slatterback. "Where this is not practical, exotic materials superior to ceramics and carbides will be developed. Predictive maintenance software and tool failure sensors are already being applied. Machine tool manufacturers will include coordinate measuring as a part of the normal functions of the tool; that, together with photo imaging, vision and other sensors will perform the inspection tasks."

As machine tools and robots become more sophisticated and more flexible, the material handling systems that link these systems must also become more intelligent and more versatile. The full potential of tomorrow's manufacturing systems only will be realized if they are continuously kept busy. Parts and materials must flow in an uninterrupted stream between machines, morning, noon, and night.

Islands of automation

Material handling systems will be crucial to the maintenance of this flow. Just the right amount of items must be brought to just the right place at just

Robots are a critical element of flexible manufacturing systems and cells. These robots perform operations such as material handling and changing the tooling for one or more machine tools. In the future with the assistance of accessories like the laser, robots will become increasingly involved in metalworking.

A manufacturer searching for better ways to to produce parts has to be very careful that he does not turn too quickly to technology for the quick fix he needs to pep up his sagging productivity. When re-evaluating company philosophy and startegies, the consideration of specific technologies should occur only very late in the process.

the right time. In the future, material handling will provide the critical physical linkage that integrates the islands of automation in the future factory.

"I think that the challenge for material handling is to able to interface with the islands of automation that are growing up in the factory," said Walter P. Adams, director of automated systems and controls, Portec, Oak Brook, Ill. "Today, the large changes in material handling are occurring primarily in software." Software is being developed that interfaces with material handling equipment and other machinery on the shop floor.

According to Mr. Adams, as late as the late 1970s, very few guided vehicle systems had any sort of computer control other than the controls directly on board the vehicle. Today, however, the majority of these systems have a central direct computer control.

As to where material handling is going: "We will become much more involved in system integration. In fact we will be the systems integrators, the ones who really help put the whole thing together," explained Mr. Adams."

The major challenge facing the material handling industry is finding ways to interface handling equipment with the great divergence of hardware and software that can be found in most factories. Each robot or machine tool must be catered to a little differently, since no uniformity in equipment exists. Most machine tools, for example, have different load/unload mechanisms and come in different sizes, so most have to be interfaced differently.

Robots

A more localized type of material handler is the robot, although by the year 2000 the robot and the guided material handling vehicle will be one and the same. Eventually robots will be mobile, with the capability of being programmed to go anywhere in the factory. Although today's robots are not very bright and perform simple, repetitive tasks such as spray painting, material handling, and welding, tomorrow's robots, with more intelligence and advanced sensing capabilities, will be able to perform a wide variety of tasks.

According to an executive summary of robots prepared by the Yankee Group, Boston, there are certain dominant trends in robotics today. For one thing, while robots are becoming less expensive, they also are also developing a much greater range of capabilities. For another, robots are beginning to be looked at as advanced computer peripherals (like a printer, for example) and not as machine tools. In the future, states the report, "Robots will become more goal-directed; data will be input in plain English and converted to control procedures or subroutines. Also, human interfaces for programming will be developed for non-explicit commands."

Robots are a critical component of flexible manufacturing systems and cells. These robots perform operations such as material handling and changing the tooling for one or more machine tools. In the future, with the assistance of accessories like the laser, robots will become more involved in the metalworking and metal cutting operations.

With or without robot controls, the laser will become increasingly popular in the factory. For although it can be expensive to operate, its versatility and its accuracies make it an ideal tool to be found in an advanced manufacturing cell or system. Lasers can not only cut, weld, heat treat, and clad various materials, they can also help count, inspect, and measure.

A lot of work is being carried on today in attempting to incorporate lasers into manufacturing systems.

"One of the things we are trying to get together for demonstration is a flexible manufacturing cell. And this cell would take two large-diameter pipes, and would attempt to join those pipes at a funny angle," explained Don Bennett, president, Coherent General, Palo Alto, Calif. The company is a two-month-old joint venture between General Electric and Coherent, Inc.

To prepare the pipes for joining, the laser would cut a hole in one pipe where the other is to be joined, cut the end off that other pipe, and then put the two pipes together and weld them.

Lasers in a manufacturing cell will be increasingly common. Another trend will be the use of lasers on machining centers to do operations that the machine tool is unable to do. Coherent General also sees robots as suitable partners for it's lasers. To this end, the firm has just introduced a laser-toting robot.

"We will see robots in the future with lasers built right into their arms," said Mr. Bennett. Robots with lasers and vision systems would be able to weld, measure, and do all sorts of metalworking operations.

Future lasers will increase their flexibility by simply changing a lens.

"We have developed the concept of a laser with a tool changer. This tool changer will be loaded with what we call optical tools. These tools are set up to do different functions while the raw laser beam is the same in all cases," said Mr. Bennett.

The variety of types of equipment that will go into Factory 2000 is enormous and cannot be covered in one article. This article has not even talked about the most popular factory automation products: CAD/CAM systems, which allow the designer to produce product drawings on a computerized CRT screen. CAD/CAM significantly speeds up the work of the designer and also allows him to rotate, enlarge, dissect, and even test and analyze the physical characteristics of that part he has drawn, right on the screen.

Artificial intelligence, sure to play a major role in tomorrow's factory, has not been discussed either.

"Artificial intelligence will have a major impact on CIM within this decade," asserted Richard E. Morley, director, advanced technologies, Electronic Systems Business Section, Gould Inc., Amherst, N.H. "Simply, put, artificial intelligence is the ability to take a data base, convert it by means of appropriate rules of thumb, and put it into a system that is goal-directed—in other words, data converted by rules to accomplish goals."

New metalworking machines and new materials such as composites and ceramics have not yet been mentioned, nor have new developments in sensors and quality testing. The list is too long; yet all will play important roles in the factory of the future.

What is obvious is that there is more advanced technology around than a manufacturer knows what to do with. And even more developments are just around the corner. Today, choosing to automate should not be contingent upon the appearance of some spectacular new technology that will solve all problems for a very low cost. But, U.S. manufacturers, fascinated by Star Wars technology, continue to dream.

What is needed is a realistic vision, not a dream, and some advice on the first steps to take in order to realize that vision.

STEPS TO INTEGRATION

A number of blueprints have been drawn up which outline the specific steps companies should take to construct the factory of the future. However, if a firm wants to build its Factory 2000, it should ignore these detailed automation plans for as long as possible.

A manufacturer searching for better ways to produce parts has to be very careful that he does not turn too quickly to technology for the quick fix he needs to pep up his sagging productivity. When re-evaluating company philosophy and strategies, the consideration of specific technologies should occur only very late in the process.

Before anything else, the first step toward Factory 2000 is an educational one. And who better to take that first step than the CEO.

Educating management

"Companies have got to start by educating senior management as to the strategic benefits of things like CIM, or total quality control or just-in-time manufacturing," insisted Mr. Gunn of Arthur D. Little. "There are powerful tools out there and that should be understood. Take a concept like CIM, it is a valuable tool that delivers proven strategic as well as financial benefits to the company. You simply have to make top management aware of that. And most aren't aware.

"You also have to get them thinking strategically, make them see that they can compete on their ability to engineer and manufacture products. That is the real basis of competition if you are a manufacturing company. And there are ways we can use CIM to change that basis of competition."

Hopefully, the result of taking step one will be a purging of the misconception that plant operations are pretty much a given: that materials are fed into one end and a product emerges out the other side, often late and not of the highest quality; and that nothing can change that reality. Another consequence of taking step one should be a growing awareness that to do nothing is to die. "It maybe a slow death by a 1000 cuts but death just the same," commented Mr. Gunn.

Step two toward Factory 2000 involves setting goals and devising strategies to reach those goals. In developing these strategies three questions must be answered: Where am I? Where do I have to get to? And how do I get there?

"After you set the strategic objectives and realize what you want to accomplish: like reduce new product development time by 50 pct in two years, or increase inventory turns from 5 to 25 over the next two years, you can then look at how you can achieve those things and the tools to support that," said Mr. Gunn.

However, before a company can develop specifications of how modernization is going to take place, it must do some soul searching. "The company looking toward automation really has to analyze itself. Contemplate its own navel," explained Ralph Waite, vice president and general manager, ICC Business, Allen-Bradley Systems Division, Highland Heights, Ohio. "You don't do this self-analysis by merely setting up an automation task group somewhere. You do this by having management that is in place work together defining goals."

People heavily involved in manufacturing have to be part of this discussion. And their planning should be of the top-down variety. As mentioned, discussions of specific hardware still should not bar entering the conversation.

"The goal of these planners should be to create a functional specification of how they want to run their plant, not specifications of the equipment required to do it," said Mr. Waite. "They should define the task that is to be done, not how it is to be done."

But plans cannot be finalized until management really knows what is going on in its manufacturing facility. "A plan must be developed to analyze the existing plant," said Mr. Waite. "This

Besides being exciting, the vision of your future factory should be carefully conceived, and the plans to fulfill that vision clearly spelled out. A long-range plan should start with an inventory of you current environment.

Then it would be helpful to know:what technologies you have already implemented.

is really a major task and has to be documented."

Where are we going?

This documentation is necessary because before goals can be formulated, before it can be determined where a company is going, it must be known where the company is today.

Once strategies and self-evaluations have been carried out, step three is to establish a corporate-wide culture. "Factory automation cannot occur in a vacuum," explained Mr. MacFarlane of the Gartner Group. "Without an intelligent, informed, and committed management and technical staff, factory automation techniques cannot achieve their goals no matter which implementation technique is chosen."

Step four is the development of a unified communications structure or architecture, which ensures that people in the company are all pulling in the same direction.

"Consistent with the strategy and expertise of the people involved, the central architecture of the factory automation system must be established. This prevents a series of disheartening false starts and lengthy re-implementations without appreciable productivity gain," said Mr. MacFarlane.

"We see so many firms... that encourage each division to go off and do what it wants with different systems that don't talk to each other. Some day it is going to take millions of dollars and more important: years, to correct this mistake," said Mr. Gunn.

An interesting paradox arises when companies discuss moving from basic manufacturing into high-tech production. "When the implementation of modern technology is successful, it forces companies to get back to the basics, to get together and find out what are the major problems that need solving," explained Mr. MacFarlane.

If firms build their Factory 2000 on a shaky foundation, the factory will have little chance, for if inaccurate information on what is really happening in manufacturing is fed into the computers, the result will be, as they say in Silicon Valley; garbage in, garbage out.

VISIONS OF TOMORROW

Until now, this article has examined the stepping stones to be touched on and the log jams to be dislodged before Factory 2000 can be safely reached. But before any stepping and dislodging can take place, a manufacturer must have some idea where he is going. He must have the vision of Factory 2000 before him. To help flesh out that vision, we willlook at some possible shapes of this fantasy.

One problem with many modernization efforts today is that they are fragmented. Divisions and plants within companies are going their own way. Someday all of these organizations will linked together. But as the ad says: "You can pay me now or you can pay me later." If integration is ignored now, it will be heard from at a later date. Someday, when no more options are available, companies will be forced to embrace integrated manufacturing solutions. However, the longer firms wait, the more disruptive and costly the transition will be.

According to Mr. Slautterback of Koppers, Factory 2000 will be very unlike anything we have today. Because of the need for industry to survive, to remain competitive, and because of exploding computer technology, manufacturing change over the next two decades will be rapid. Because a good deal of change could occur during the next 16 years, Factory 2000 probably will look quite different from anything we have today. Although the Japanese have already built two or three plants that are operated by only a few people.

By the time the year 2000 rolls around, "The distinctions between the process industries and discrete manufacturing; between the manufacturing of electronics and machinery; between assembly and fabrications; between engineering and manufacturing will all tend to blend (or blur) as an economic lot size of one is approached," speculated Mr. Slautterback.

More specifically, tomorrow's factory "...will have defined generic work centers depending upon the process or automation requirements," suggested Mr. Morley of Gould. "These process centers will have generic manufacturing, or certainly FMS approaches to manufacturing. Some of the processing will, of course, be robots inside each of these FMS centers. These centers will in turn be interconnected by materials handling components such as material handlers, and intelligent vehicles and conveying systems.

Mr. Morley continued,"Robots will be used as local material handlers to put parts in and manipulate parts within these flexible machining centers. A command and control center will be used to modify, control, monitor, and in general, run the automation system of the future."

Most futurists say that tomorrow's factory will not be devoid of people. These people, however, would be performing much different jobs than factory workers today. The people primarily would be the decision makers who would use the timely decision support information prepared by computers using artificial intelligence.

"In the year 2000, computer applications will make possible the unmanned factory," said Mr. Slautterback. "The individuals remaining in manufacturing will be primarily top managers, engineers and skilled maintenance personnel. Hierarchical organizations will become obsolete, because dynamic responsiveness will be required to maintain competitive leadership. This means that organizations currently with 11 to 15 levels of employment will streamline to 4 to 7 levels. The pyramid will flatten or perhaps become diamond shaped.... It is interesting to note that over 70 pct of the jobs in the year 2000 cannot be identified or described today."

Generalist

The future employee will be a generalist, he will be cross-trained in several jobs. The staff engineer, for example, will design and instruct the manufacture of products from his graphic workstation.

"The engineer will analyze, schedule, instruct the robot, create the process plan, create the NC machining instructions, define inspection criteria, simulate the complete process, as well as many other tasks," concluded Mr. Slautterback. "He therefore will become line management. The line manager, on the other hand, will monitor the manufacturing environment for unexpected problems and become functionally staff."

Besides being exciting, the vision of your future factory should be carefully conceived, and the plans to fulfill that vision clearly spelled out. A long-range plan should start with an inventory of your current environment.

Then it would be helpful to know: what technologies you have already implemented, "The availability and status of new technologies. The logical sequence of implementation. The rate of change that your company can tolerate. The real cost and potential benefits. Who is the champion to lead each area of charge. And what is the implementation status of your global competitors," outlined Mr. Slautterback.

Despite the complicated technical tools that will be used in tomorrow's factory, operations actually will be much simpler. Already procedures have started to get simpler in a few factories.

"Parts now are being designed to be made easily; thousands of parts have been replaced by hundreds of families of parts; hundreds of machines have been replaced with several flexible manufacturing systems.

"Large inventories and long lead times have been replaced with small inventories and short lead times that are manageable; confusion created by scrap and rework has been drastically reduced; automated material handling has improved the material flow and part location; fewer employees have created less confusion; less paper has reduced transposition errors, lost copies, and filing mistakes.

"Redundancies have been eliminated; and the walls between manufacturing, engineering, marketing and finance have been replaced with one cohesive system that works: computer-integrated manufacturing," said Mr. Slautterback.

Even now far-seeing companies are taking their first tenative steps toward the 21st century. A century where the factory manager, much like the early potter, will again have integrated mind, tools and materials into an integrated operation. ☐

Reprints available while supply lasts. For single copy, circle No. 60 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1029

WARNING: A COKE SHORTAGE JUST AROUND THE CORNER

BY GEORGE J. MCMANUS

There is no mystery to all of this. Since 1973 there has been a net decrease of 10 pct in steel capacity. In the same period coking capacity has declined nearly 50 pct.

"I predict there will be a coke shortage," said James T. Bradford, executive vice prsident, Jones & Laughlin Steel Corp.

"I don't think it will be until 1985," Mr. Bradford said.

Officials of Rouge Steel agreed it would be early 1985 before the domestic industry was hit by a coke pinch.

The exact timing may depend on how you define shortage. "We're into a coke shortage now in that we're rapidly consuming our stockpile," said J. Gordon Price, president of Dravo/Still, the joint venture recently formed by Dravo Engineers, Inc., and Firma Carl Still of West Germany.

"We've been sitting here waiting for this to happen," said W.D. Edgar, chief engineer of what used to be the E&C group of Koppers Co., and is now part of Raymond Kaiser Engineers, Inc.

In terms of domestic capacity, the shortfall could be said to extend back quite a while. "Because of the shortage of domestic coke," said Thomas G. Katsahnias, vice president, manufacturing, Inland Steel Co., "U. S. steelmakers, including Inland, have imported some part of their needs off and on since the late 1970's."

There is no mystery about all this. Since 1973, there has been a net decrease of 10 pct in steelmaking capacity. In the same period, coking capacity has declined nearly 50 pct. Only a little over 30 million tons can be produced in domestic coke ovens today.

Moreover, the remaining capacity is a source of embarrassment and distress. Much of it is represented by relatively new "tall" ovens. These aren't producing up to designed rates and they aren't standing up. Many of them have about reached the end of a life expectancy that is only 10 years.

This is a world wide problem, and may affect the availability of foreign coke. This could be critical because there is a growing reliance on imports.

Inland began talking in 120,000 tons of Japanese coke in early May. Four ocean freighters were bringing Inland 65,000 tons of Italian coke in May and August. Three ships were due to bring 45,000 tons from Britain in late June.

"These three supplies together equal about 8 pct of our total yearly coke consumption," said Mr. Katsahnias,

The recent technical history of coking has been marked by disaster and fiasco. Photo: Weirton W. Va.

A prolonged coal strike could throw a wrench into the workings of steel

Bethlehem Steel Corp. is in good shape on coke. "At 80 pct of capacity, we're probably very comfortable," said Richard O. Wenger, division manager, raw materials inventory.

Nevertheless, Mr. Wenger and Bethlehem have a few worries.

"The thing that could screw it all up would be a very long coal strike," said Mr. Wenger.

Coal contracts expire the end of September. A coal strike deadline is always serious for steel producers, but there is special concern this year.

"Business is finally picking up a little bit," said Mr. Wenger. "I'd hate to see that get messed up because we ran out of raw materials."

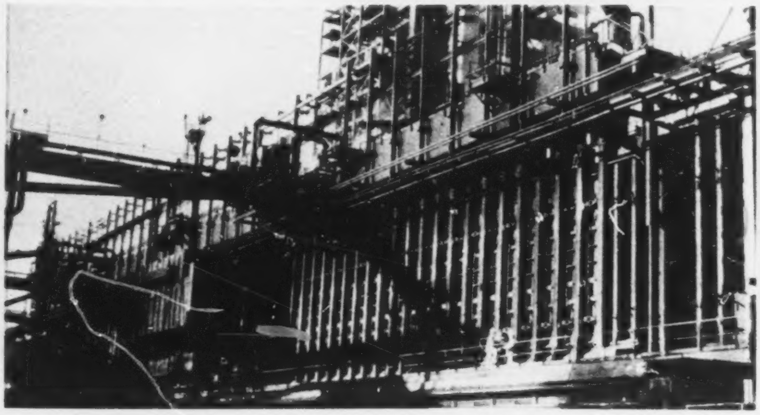
Another concern is "the fact that there is new leadership in United Mineworkers. That always raises questions about what to expect."

Looking down the road, Mr. Wenger wonders about the cost of providing coke capacity. "The cost of new coke batteries has gotten up to the point where it would take away from a lot of other things we should be doing in the steelmaking plants."

An estimate of $200 million as the cost of a big new battery could be conservative, he said.

Future supply could also be affected by the early failures of the newer, tall batteries. "I'm concerned with it on the basis of how reliable the supply will be over the years," said Mr. Wenger.

The situation on one tall battery has reached the stage of legal action. Questions on this drew only a terse statement. "Bethlehem is engaged in litigation concerning the Sparrows Point A battery with McKee Otto."



The shortage of domestic coke has led some steel producers to import some part of their need. Photo: Inland Steel Co., coke battery No. 11.

"and they are being purchased because we can't fill our needs internally."

National Steel Corp. has 1.4 million tons of coking capacity and a requirement for 2 million tons. This difference is being made up with purchased coke, domestic and foreign.

"Right now, we're about 50-50," said Vaughn Knapp, director of raw materials for National Steel.

Rouge Steel is buying coke from New Boston Coke Corp. in Portsmouth, Ohio. The Portsmouth ovens were formerly owned by McLouth Steel Corp. McLouth now relies entirely on purchased coke. The same is true of Weirton Steel Corp. and Sharon Steel Corp.

Coke Imports

The coke outlook was assessed in late 1983 by Milton Deaner, president of McLouth. "If you say we're going to hit 78 million tons in 1984," said Mr. Deaner, "I say we'll import coke to do so." (*Iron Age*, Jan.2, 1984). He wasn't sure there would be much foreign coke available.

Another warning came from Vincent Sekela, executive vice president of Krupp Willputte Corp. "We predicted there would be a shortage when the industry got above 80 pct," said Mr. Sekela. "We think there's going to be a drastic shortage in May," he added.

In March, steel operations went over 80 pct. Shipments, on an annual basis, went well over 78 million tons. "If we maintain this rate, we're going to be out of coke in a few months," said W.T. Hogan of Fordham University.

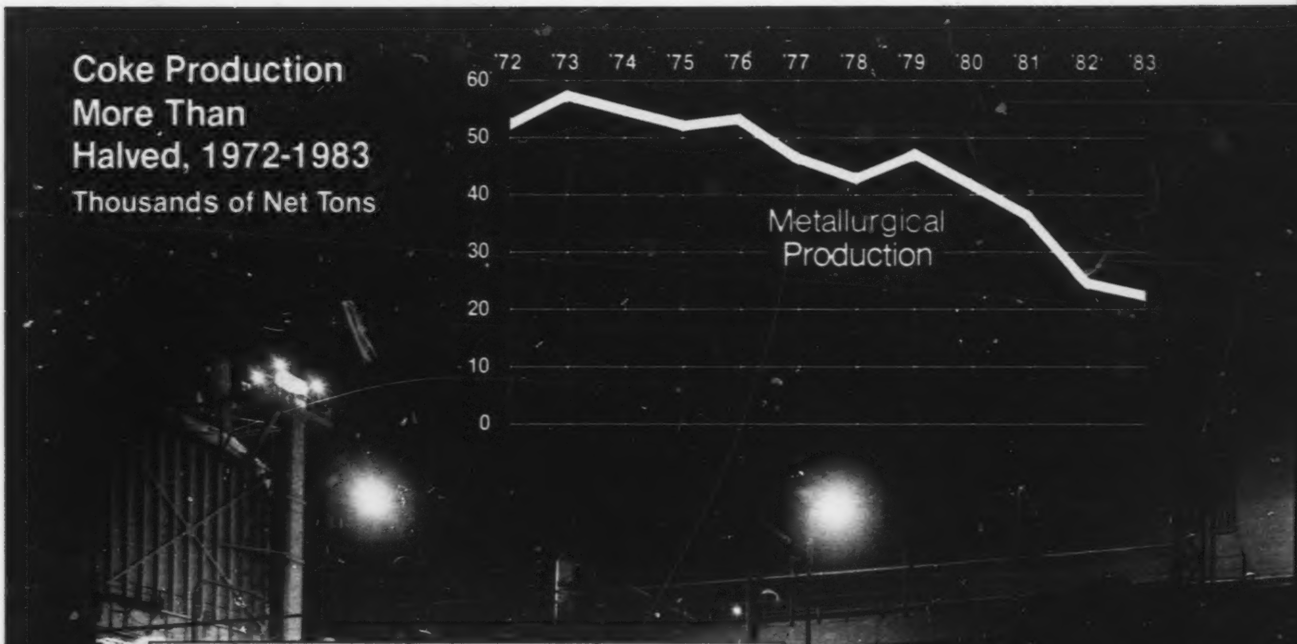
In explaining its use of imported coke, Inland implied that the domestic merchant supply had pretty well been exhausted. "Over the long haul, we prefer to fill our coke shortfall through some domestic sources," said Mr. Katsahnias. Imported coke is subject to deterioration and involves complex logistics, he said. Inland wouldn't be importing, obviously, if domestic coke were available.

"It may be running dry," said Mr. Knapp of the domestic supply, "but here and there, there are still some opportunities. I think some of the merchant producers have price ideas that are outside of the market."

As of mid-May, merchant coke was delivering for around $100 a ton. The Japanese were selling aggressively, and domestic suppliers were reportedly waiting for more favorable terms.

There is a fairly large merchant coke supply. In 1983, over 4 million tons of coke were purchased. Portions of this could be coming from captive ovens of the big mills. United States Steel Corp. reportedly has excess capacity at Clairton, Pa. Bethlehem Steel Corp. has over 1 million tons of coking capacity at Lackawanna, N. Y.

Weirton Steel has lined up domestic sources. "I've been able to get firm commitments for the next three years," said Malcolm A. Wilkinson, vice president, purchases and traffic.


Coke Production More Than Halved, 1972-1983
Thousands of Net Tons

Year	Receipts Incl. Imports	Blast Furnace Consumption	Coke Per Ton of Iron
1983	4,161	26,268	0.539
1982	2,704	23,322	0.538
1981	5,614	40,451	0.550
1980	4,103	39,146	0.570
1979	7,972	50,008	0.575
1978	6,520	51,286	0.585
1977	5,057	48,510	0.597
1976	7,743	51,561	0.594
1975	4,257	48,817	0.611
1974	7,046	58,768	0.609
1973	4,114	60,720	0.597
1972	3,293	54,608	0.608

Source: AISI

Mr. Wilkinson looked for further shrinkage of the domestic coke supply but he didn't expect a global crunch. "Coke will probably be available world wide," he said.

Coking capacity was one consideration in the merger of Jones & Laughlin Steel Corp. and Republic Steel Corp. "Republic is in a good coke position," said Mr. Bradford. There are new batteries in Chicago-Warren, he noted. "J&L and Republic will be in a pretty good position."

There hasn't been a good test of the foreign coke supply for some time. During the slack times of 1982 and 1983, almost no coke was imported. According to the Commerce Department, only 34,000 tons entered the U.S. in 1982.

Since the start of 1984, imports have spurted. Over 70,000 tons of coke entered the U.S. in January and more than 100,000 tons in February. The big source has been Japan, which accounted for 77,000 tons in February. It is something of a paradox that Japan, which is a fuel have-not, should be supplying coke to the U.S., which has abundant coal reserves.

There is probably some surplus coke in Europe. In the last import crunch, most of the foreign coke came from West Germany. That country provided 4 million out of the 5.7 million tons imported in 1978.

The Germans are said to be sitting on a 20-million-ton coke stockpile now. As of May, none of this was being offered for export. Higher prices will be needed to bring out the German coke, said one buyer.

Shortfall

The domestic deficits are partly a matter of new management strategy. "There was a point in time when we thought as an integrated steelmaker we ought to be close to 100 pct in all of our raw material needs," said Mr. Knapp. "I don't think we have that same thinking any more."

The mills did some new thinking when they found themselves locked into huge iron ore commitments. And the economics of coke oven construction are very unattractive. A 1-million-ton battery can run about $200 million. For a little over $200 million, National was able to buy United Financial of California in 1979.

Apart from cost, the recent technical history of coking has been marked by disaster and fiasco. It has proved almost impossible to make coke efficiently while complying with government regulations.

To control pushing emissions, a plants tried putting sheds or canopies over the ovens. They did a good job of containing dust, but drew complaints from unions and health regulators.

The mills then went to quench cars with various scrubbing systems. There were maintenance problems and high energy costs, and operators are coming back to stationary systems.

"I think most people are leaning toward sheds now," said Mr. Edgar of Raymond Kaiser.

Inland's situation brings out the extent of technical headaches. In 1983, Inland shut down C battery. This had the capacity to produce over 470,000 tons a year.

C Battery wasn't old; it was started in August of 1974. The life of the short ovens is 37 years. Nevertheless, C battery had deteriorated to the point where a shutdown was necessary.

The alternative was a complete rebuild at a cost of millions. "And even if funds were available to start a rebuild, it couldn't be in production before late 1986 or early 1987 period," said Mr. Katsahnias.

Some of C battery's problems came from Inland's pioneering of pipeline charging and coke pre-heating. The pipeline concept seemed the ideal answer to charging emissions. It may prove to be so, but Inland had all kinds of trouble with C battery. A second pipeline application by the company has been much more satisfactory.

Domestic steel mills are doing some stockpiling but the last two coal strikes had little impact on steel operations.

There were special problems with the first pipeline, but C battery also shared in the general problems of the tall ovens. Starting in the late Sixties, North American mills began building coke batteries that were 5 meters or more in height.

These were designed to produce coke in about 12 hours. It turned out that there were problems with stack emissions, door leaks, and wall cracks. It proved impractical to maintain the short coking cycles.

"People have backed off on operating rates," said Mr. Edgar.

As a result, most of the tall batteries are performing well below their designed capacities. Annual output in typical installations is running 200,000 to 300,000 tons below the expected rate.

Premature Failure

In addition, the tall ovens have been subject to premature failure. The older, short ovens are lasting 35 years. The earlier tall ovens are given a life expectancy of 10 years. The late models are expected to last 18 years.

In a group of 25 tall ovens, five are down or have had to have major rebuilding. It's possible ways will be found to improve production rates and life spans; a great deal of work is being done on the tall batteries; but they remain a worry in the coke situation.

No one seems too concerned about the possibility of a coal strike Sept. 30. Domestic mills are doing some stockpiling but the last two coal strikes had little effect on steel operations or anything else. Officials of United Mineworkers of America have indicated they may try selective strikes this time.

Underway in May were a British coal strike and a German metals strike. Coming up was the deadline for a possible auto strike in the U.S. ☐

Reprints available while supply lasts. For single copy, circle No. 99 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1027

PRICE & PRODUCTION DATA

(Effective May 21, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	254	247	267	188
Buffalo	11	12	11	32
Pittsburgh	301	298	292	195
Youngstown	97	102	118	102
Cleveland	147	155	147	134
Detroit	185	174	186	140
Chicago	578	581	577	490
Cincinnati	130	124	121	91
St. Louis	91	89	85	75
Southern	232	238	233	143
Western	90	90	90	107
U.S. Production	2,116	2,110	2,127	1,697

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective May 21, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	2,116	2,110	39,749	30,273
Capability Utilization Rate	81.5	81.2	76.8	52.3

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 5/14/84)	27.405	27.405	26.939	26.217
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 89.50	$ 89.50	$ 90.17	$ 67.50
No. 2 bundles	$ 60.17	$ 60.17	$ 60.83	$ 46.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$100.50	$100.50	$100.50	$ 68.50
No. 1 steel, Philadelphia	82.50	82.50	84.50	66.50
No. 1 steel, Chicago	85.50	85.50	85.50	67.50
No. 1 bundles, Detroit	92.50	92.50	89.50	69.50
Low Phos., Youngstown	98.50	98.50	96.50	71.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	74.50
No. 1 mach'y cast., Phila	100.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	117.50	117.50	117.50	106.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective May 21, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	68.00-69.00	69.00	5/15/84
Lead	25.00-28.00	26.00-28.00	5/3/84
Magnesium Ingot	143.00	138.00	1/3/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	52.00-53.00	53.00	5/3/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Bismuth, ton lots	$1.65-$1.80
Cadmium, ton lots	$2.25
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$380.75
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$325-$335
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.99
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

May 14—573.85
May 15—573.72
May 16—573.98
May 17—573.85
May 18—567.24

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64⅛	63
Yellow brass	59⅜	59
Red brass	61¼	60
Comm. bronze	62⅛	60¼
Mang. bronze	62¼	53½
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	60
No. 2 copper wire	51
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	47
Light copper	38
No. 1 composition	57
No. 1 comp. turnings	56
Hvy. yellow brass solids	38
Hvy. yellow brass turnings	36
Radiators	47

Aluminum

New mixed clips	46	—47
Old sheet	44	—45
Old cast	44	—45
Clean dry borings	45	—46

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	38	—40
Old sheets and cast	34	—35
Borings and turnings	26	—28
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	51	—52
No. 2 copper wire	42	—43
Light copper	37	—38
Radiators	35	—36
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	46	—47

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	60	— 70

Zinc

New zinc clippings	18	— 19
Old diecast zinc	13	— 14

EFFECTIVE MAY 21, 1984

(Effective May 21, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$100.00 to $101.00
No. 2 hvy. melting	90.00 to 91.00
No. 1 dealer bundles	118.00 to 119.00
No. 1 factory bundles (auto)	119.00 to 120.00
No. 2 bundles	59.00 to 60 00
No. 1 busheling	117.00 to 118.00
Machine shop turn	16.00 to 17.00
Shoveling turnings	54.00 to 55.00
Cast iron borings	53.00 to 54.00
Low phos. punchings plate	119.00 to 120.00
Heavy turnings	90.00 to 91.00
No. 1 RR hvy. melting	113.00 to 114.00
Rails 2 ft. and under	125.00 to 126.00
Scrap rails, random lgth.	109.00 to 110.00
RR specialties	124.00 to 125.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	600.00 to 610.00
18-8 turnings	500.00 to 510.00

Chicago

No. 1 hvy. melting	$ 85.00 to $ 86.00
No. 2 hvy. melting	81.00 to 82.00
No. 1 dealer bundles	116.00 to 117.00
No. 1 factory bundles (auto)	116.00 to 117.00
No. 2 dealer bundles	64 00 to 65.00
No. 1 busheling	107.00 to 108.00
Shredder scrap	103.00 to 104.00
Machine shop turn	46.00 to 47.00
Mixed bor. and turn	47.00 to 48.00
Shoveling turnings	56.00 to 57.00
Cast iron borings	57.00 to 58.00
Low phos. forge crop	122.00 to 123.00
Low phos. punchings plate ¼ in. and heavier	132.00 to 133.00
Low phos. 2 ft. and under	127.00 to 128.00
No. 1 RR hvy. melting	107.00 to 108.00
Scrap rails, random lgth.	107.00 to 108.00
Reroller rails	112.00 to 113.00
Rails, 2 ft. and under	126.00 to 127.00
RR couplers and knuckles	110.00 to 111.00
RR car axles	134.00 to 135.00
No. 1 machinery cast	117.00 to 118.00
Cupola cast	108.00 to 109.00
Stove plate	106.00 to 107.00
Steel car wheels	120.00 to 121.00
Stainless	
18-8 bundles and solids	555.00 to 565.00
18-8 turnings	455.00 to 465.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 81.00 to $ 84.00
No. 2 hvy. melting	71.00 to 74.00
No. 1 dealer bundles	103.00 to 106.00
No. 2 dealer bundles	55.00 to 58.00
No. 1 busheling	104.00 to 107.00
Shredder scrap	97.00 to 100.00
Machine shop turn	29.00 to 32.00
Mixed bor. and turn	29.00 to 32.00
Shoveling turnings	47.00 to 50.00
Low phos. 5 ft. and under	102.00 to 105.00
Low phos. 2 ft. punchings	120.00 to 123.00
Electric furnace bundles	114.00 to 117.00
RR specialties	106.00 to 109.00
Rails, 2 ft. and under	120.00 to 123.00
Cupola cast	72.00 to 75.00
Heavy breakable cast	57.00 to 60.00
No. 1 machinery cast	99.00 to 102.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to $ 66.00
No. 2 hvy. melting	62.00 to 63.00
No. 1 dealer bundles	92.00 to 93.00
No. 2 bundles	44.00 to 45.00
No. 1 busheling	91.00 to 92.00
Drop forge flashings	62.00 to 63.00
Machine shop turn	47.00 to 48.00
Mixed borings and turn	28.00 to 29.00
Shoveling turnings	48.00 to 49.00
Cast iron borings	46.00 to 47.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	475.00 to 485.00
18-8 turnings	375.00 to 385.00
430 bundles and solids	120.00 to 130.00

Youngstown

No. 1 hvy. melting	$ 85.00 to $ 88.00
No. 2 hvy. melting	67.00 to 70.00
No. 1 dealer bundles	100.00 to 103.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	97.00 to 100.00
Electric furnace bundles	93.00 to 97.00
Galvanized bundles	86.00 to 89.00

Cleveland

No. 1 hvy. melting	$ 76.00 to $ 79.00
No. 2 hvy. melting	50.00 to 53.00
No. 1 dealer bundles	97.00 to 100.00
No. 1 factory bundles	97.00 to 100.00
No. 2 bundles	30.00 to 33.00
No. 1 busheling	95.00 to 98.00
Machine shop turn	13.00 to 16.00
Mixed bor. and turn	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	122.00 to 125.00
Low phos. punchings plate	122.00 to 125.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	122.00 to 125.00
Rails, 18 in. and under	123.00 to 126.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	109.00 to 112.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 76.00 to $ 77.00
No. 2 hvy. melting	63.00 to 64.00
No. 1 busheling	89.00 to 90.00
No. 1 dealer bundles	89.00 to 90.00
No. 2 bundles	40.00 to 41.00
Machine shop turn	15.00 to 16.00
Mixed bor. and turn	13.00 to 14.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	25.00 to 26.00
Low phos. plate	102.00 to 103.00
Structural and plate, 2 ft. and under	102.00 to 103.00
Rails, 2 ft. and under	97.00 to 98.00
Scrap rails, random lgth.	77.00 to 78.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 78.00 to $ 79.00
No. 2 hvy. melting	67.00 to 68.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	78.00 to 79.00
No. 2 bundles	65.00 to 66.00
Machine shop turn	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	33.00 to 34.00
No. 1 RR hvy. melting	84.00 to 85.00
Rails, random length	82.00 to 83.00
Rails, 18 in. and under	94.00 to 95.00
RR specialties	92.00 to 93.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	88.00 to 89.00
Cast iron car wheels	57.00 to 58.00
Rerolling rails	90.00 to 91.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 82.00 to $ 83.00
No. 2 heavy melting	76.00 to 77.00
No. 1 dealer bundles	82.00 to [illegible]
No. 2 bundles	57.00 to 58.00
No. 1 busheling	82.00 to 83.00
Shredder scrap	104.00 to 105.00
Machine shop. turn	41.00 to 42.00
Shoveling turnings	50.00 to 51.00
Cast iron borings	50.00 to 51.00
Electric furnace bundles	75.00 to 76.00
Elec. furnace, 3 ft. & under	80.00 to 81.00
Structural and plate, 2 ft.	108.00 to 109.00
Structural and plate, 4 ft.	102.00 to 103.00
No. 1 RR hvy. melting	102.00 to 103.00
Scrap rails, random lgth.	95.00 to 96.00
Rails, 2 ft. and under	110.00 to 111.00
Angles and splice bars	102.00 to 103.00
No. 1 cupola cast	94.00 to 95.00
Unstripped motor blocks	74.00 to 75.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 70.00 to $ 71.00
No. 2 hvy. melting	64.00 to 65.00
No. 1 dealer bundles	83.00 to 84.00
No. 2 bundles	41.00 to 42.00
Machine shop turn	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	27.00 to 28.00
Low phos. 18 in. and under	102.00 to 103.00
Rails, random length	83.00 to 84.00
Rails, 2 ft. and under	98.00 to 99.00
No. 1 cupola cast	72.00 to 73.00
Heavy breakable cast	37.00 to 38.00
Drop broken cast	89.00 to 90.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 52.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn	11.00 to 13.00
Machine shop turn	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	510.00 to 530.00
18-8 turnings	410.00 to 430.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to $ 70.00
No. 2 hvy. melting	58.00 to 60.00
No. 1 dealer bundles	75.00 to 77.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	81.00 to 83.00
Shredder scrap	73.00 to 75.00
Machine shop turn	14.00 to 16.00
Shoveling turnings	20.00 to 22.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to $ 47.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	35.00 to 37.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to $ 48.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	36.00 to 38.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn	10.00 to 12.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	42.00 to 44.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	59.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn	45.00
Short steel turn	43.00
Mixed bor. and turn	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 81.00 to $ 82.00
No. 2 hvy. melting	67.00 to 68.00
No. 2 bundles	44.00 to 45.00
Machine shop turn	18.00 to 19.00
Crushed turnings	42.00 to 43.00
Shredder scrap	83.00 to 84.00
Cut structural plate, 2 ft. and under	103.00 to 105.00
Cut structural plate, 5 ft. and under	95.00 to 97.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	80.00 to 81.00

PRODUCER KEY

With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	26.26	33.90	33.70	31.00	25.83	22.67	19.31	31.54	34.34	50.60	69.58	73.19
Baltimore	26.28	30.72	37.59	36.83	33.68	28.80	22.05	37.10	57.45	64.70	71.71	77.05
Birmingham	24.03	31.90	32.34	30.92	25.55	23.01	19.58	29.68	49.31	58.90	68.10	74.43
Boston	32.76	37.74	42.52	45.84	35.34	30.06	22.24	37.99	47.00	53.38	62.32	66.00
Buffalo	29.86	34.53	41.01	38.75	33.76	27.29	19.47	33.61	40.10	47.82	55.33	62.14
Chicago	28.82	34.02	37.41	34.32	25.66	23.38	17.46	32.68	36.51	41.03	46.46	52.27
Cincinnati	27.68	33.79	36.41	30.60	24.04	23.97	17.90	32.47	36.40	40.83	46.27	51.76
Cleveland	28.28	34.38	37.18	35.69	27.26	26.83	18.19	34.50	36.46	41.15	45.24	52.67
Denver	33.68	38.11	40.59	36.10	34.69	28.21	21.10	44.31	50.69	59.53	67.39	75.21
Detroit	28.28	34.80	37.86	31.69	26.63	27.74	15.96	32.63	36.47	40.91	46.42	54.09
Houston	33.36	34.55	38.93	44.02	32.64	27.96	23.54	42.81	47.06	54.33	59.94	67.04
Kansas City	30.56	35.85	39.74	39.49	28.35	29.79	19.72	34.68	41.69	46.71	53.11	61.14
Los Angeles	28.16	34.70	38.37	42.32	35.80	36.02	29.36	42.05	53.29	60.79	66.55	72.70
Memphis	25.34	33.05	34.52	33.57	27.06	28.48	22.33	34.94	36.78	49.96	59.80	69.44
Milwaukee	28.79	34.46	37.09	30.93	24.26	23.51	17.13	32.11	36.70	41.42	45.91	53.21
New York	30.89	37.51	42.55	40.22	34.62	27.21	21.06	41.14	46.00	51.91	61.12	68.72
Philadelphia	29.76	34.86	40.92	44.86	33.39	28.75	20.85	39.37	46.26	55.41	65.77	72.08
Pittsburgh	33.67	39.53	43.78	34.29	37.60	29.92	21.29	30.60	43.01	49.15	55.93	63.28
Portland	28.96	32.06	38.73	36.93	32.88	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	28.84	33.36	38.86	40.86	36.05	34.13	26.13	42.99	54.58	62.64	68.90	76.72
Seattle	23.94	33.41	35.11	34.23	25.49	27.32	26.14	40.05	52.66	66.22	74.14	77.49
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	37.31	34.14	26.19	23.48	18.40	33.76	37.79	42.74	49.38	53.69
St Paul	28.18	32.65	35.91	37.69	26.91	24.27	17.70	33.96	36.81	41.49	46.69	52.95

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 80. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A. = Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	22.45
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢

**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7, I4	23.95
U1, I3, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	26.10
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRICES RISE AT MODERATE PACE

Government officials are using the latest producer price data as evidence that the economy is not overheating as some analysts have alleged.

Overall, producer prices were unchanged in April compared with March, according to the Bureau of Labor Statistics. All individual categories shown at right were up, but each was so slight as to be negligible.

The zero rate of change in April followed three months of acceleration which raised fears that inflation was being re-started. Not so now, says the White House. The producer price figures coupled with the 2.9 pct rise in retail sales show "a solid expansion of the economy without inflation and that the recovery is on course," said White House spokesman Larry Speakes.

The index for capital equipment, which makes up about 22.2 pct of the producer price yardstick, moved up 0.3 pct in April, the same as in March. The largest of the increases was registered for heavy motor trucks, 2.5 pct, all others were in tenths of a percentage point.

The annual rate of increase for the government's producer price index for January through April is a moderate 4.4 pct. Although higher than last year's annual increase of 0.6 pct, the pace is a reassuring sign that prices at the wholesale level are not pressuring consumer prices at retail.

Prices in April for metal-cutting machine tools rose 0.4 pct while those for metalforming machine tools rose 0.2 pct, the same as in March.

The index of intermediate products used in various stages of production edged up 0.1 pct, after seasonal adjustment, following a 0.5 pct jump in March.

Meanwhile, U.S. inventories rose for the ninth consecutive month in March, the latest month for which statistics are currently available. The value of inventories in March was pegged at $531.8 billion, 0.9 pct greater than February.

Latest Month Covered: April 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	383.6	+ 0.4	+ 2.3
Metal Forming Machine Tools	421.1	+ 0.2	+ 1.6
Agricultural Machinery & Equip.	335.5	+ 0.8	+ 3.6
Construction Machinery & Equip.	357.6	+ 0.5	+ 1.9
Industrial Process Furnace & Ovens	371.7	+ 0.3	+ 2.8
Industrial Material Handling Equip.	287.6	+ 0.1	+ 1.0
Pumps, Compressors & Allied Equip.	349.3	+ 0.5	+ 0.3
Fluid Power Equip. (Dec. 1970 = 100)	257.4	+ 0.2	+ 2.1
Mechanical Power Transmission Equip.	322.9	+ 0.2	+ 2.5
Automobiles	222.0	0.0	+ 2.6
Motor Trucks—Light	282.4	+ 0.4	+ 4.6
Motor Trucks—Heavy	334.4	+ 2.5	+ 5.3
Railroad Equipment	361.2	+ 0.4	+ 3.2
Fabricated Metal Structural Products	309.3	+ 0.3	+ 2.2
Electric Motors	339.3	+ 0.4	+ 4.4
Valves & Fittings (Dec. 1982 = 100)	101.8	+ 0.7	+ 1.4
Ball & Roller Bearings	338.8	+ 0.7	+ 2.3
Cutting Tools & Accessories	278.3	+ 0.2	+ 1.3
Heating Equipment	250.3	+ 0.6	+ 3.3
Plumbing Fixtures & Brass Fittings	301.4	+ 0.5	+ 4.8
Metal Containers	345.5	0.0	+ 4.1
Miscellaneous Metal Products	292.7	+ 0.3	+ 4.3

Data based on U.S. Labor Dept.'s Producer Price Index

Chilton's
June 15, 1984

IRON AGE
METALS PRODUCER

0122864 1312CK
0 JUN88
CONGRESSIONAL INFO SERV SCF
SWI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

SPECIALTY STEEL'S NEW APPROACH-CUT PRICES

LTV: The New Powerhouse in Steel

U.S. Fights Back in World Trade

Plus
In Plant Spotlight

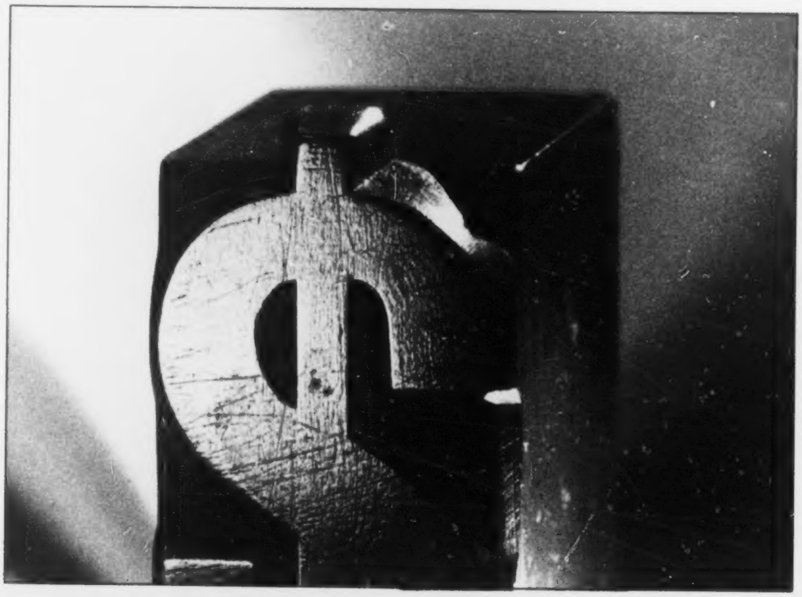
And
The Hot Spot

[redacted]

JUNE 18, 1984 VOL. 227, NO. 12

CHILTON'S

IRON AGE
METALS PRODUCER



Editorial 7
Are we ready for the fire next time?

Newswatch 13
Bethlehem and the USWA win a partial battle against imports.

The Hot Spot 25
'JIS' System can aid trade.

You and Your Job 28
Delegating is an art bosses must learn.

Specialty Steel 30
A new kind of steel pricing has developed.

Management Challenge 43
Many U.S. companies are becoming world-class competitors.

In-Plant Spotlight 59
New concepts cut rolling time.

LTV Steel 65
A merger would create a new powerhouse in steelmaking.

Quality: What It Takes 68
Timken reaches the halfway mark at its Canton plant.

Technically Speaking 69
New Jobs for ESR at Kobe Steel.

Materials Report 83
Domestic steel orders are still lagging.

Order Trends 100
Defense orders retreat in April.

Next Issue: Pollution Control.

Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 11
INDUSTRIAL BRIEFS 20
PRODUCT & EQUIPMENT REVIEW 71
PERSONNEL TOUCH 81
AD INDEX 90
MANAGEMENT SERVICE CARD 91
BUSINESS STAFF 92
P&P DATA 6/11 93
FERROUS SCRAP 6/11 95
CLEARING HOUSE 98

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY. Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

ONE OF THE ABC PUBLISHING COMPANIES

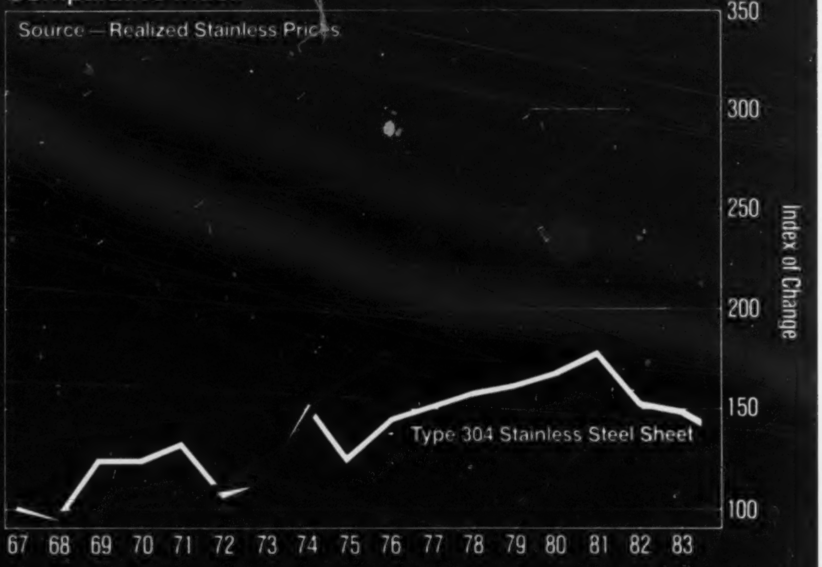
Chilton
abc

SPECIALTY STEEL'S NEW APPROACH—CUT PRICES

GEORGE J. MCMANUS

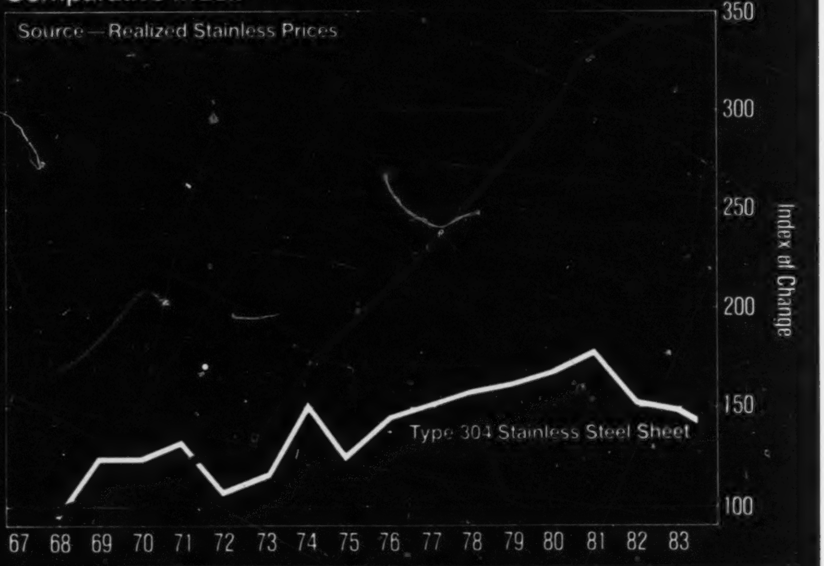
There are new opportunities (or threats) and as a result a new kind of steel pricing has developed.

Comparative Index



The effect of pricing on specialty volume is difficult to identify because there are so many things happening at the same time. One thing continues to remain significant however, that being the price of stainless steel sheet which still hovers at a low level compared to the prices of competitive materials.

Comparative Index



"We are replacing aluminum in the trim area because of price," said Richard P. Simmons, president of Allegheny Ludlum Steel Corp.

Mr. Simmons is referring to the trim on autos. He is saying the relative stability of stainless flat rolled prices is producing gains in the auto market and elsewhere.

"Everything else in the metals field has inflated five times faster than stainless," he said.

The result has been a demonstration that steel products can be subject to price-volume elasticity. The stretching action, said Mr. Simmons, is increasing the stainless content in autos to 65 pounds a car. This kind of gain makes him bullish about the future.

"We look for continued growth of the stainless flat rolled market of between 3½ and 4 pct a year."

All this is important because the whole steel industry, carbon and specialty, has been testing the effect of price on volume. In the old days, there was supposedly no effect. Steel's position in metalworking was so dominant there was little opportunity to grow by displacing other materials.

Now, aluminum and plastics are providing targets in consumer markets. There also is imported steel with its 20-25 pct share of the U.S. market.

In the specialty field imports accounted for half the tool steel and stainless rod in 1982.

There are new opportunities (or threats) and a new kind of steel pricing has developed. More specifically, the mills are making deeper price cuts than ever before. The price realization of National Steel Corp. fell from $494 a ton in 1982 to $480 in 1983. Adjusted for inflation, National's prices last year were down 12 pct from 1979.

As the stainless statistics indicate, the specialty field has long history of competitive pricing. "There's always been far more price competition in stainless steel than in carbon steel—up until the last couple of years," said Mr. Simmons.

At Carpenter Technology's new rotary forge facility can produce ingots and billets up to 25.5 in. and weighing up to 17,600 lbs.

Industry Stainless Sheet and Strip (Domestic Market)

NET TONS SHIPPED PER MONTH

	A.I.S.I.	EXPORTS	IMPORTS	DOMESTIC MARKET
AVG. 1983	72,891	1,588	7,356	78,659
1984				
JANUARY	86,105	1,039	7,940	93,006
FEBRUARY	78,854	1,964	3,873	80,763
MARCH	92,593	1,737	18,783	109,639

Index* Comparison Sheet and Strip vs. Consumer Durable Production

	STAINLESS SHEET AND STRIP	CONSUMER DURABLE PRODUCTION
JANUARY, 1983	127.8	131.6
DECEMBER, 1983	181.4	158.4
MARCH, 1984	215.9	163.3

*1967 = 100 Source: Allegheny Ludlum

Specialty prices haven't recovered from the particularly tough competition of the last two years. "Prices are depressed and well below pre-recession levels," said Adolph J. Lena, chairman of AL Tech Specialty Steel Corp. and head of the specialty industry's joint group.

For carbon steel, the container industry has the potential for an interesting price confrontation. Aluminum has taken over the beverage can market. According to a mill official, steel beverage material now sells for $10 per 1000 cans under aluminum. After fabrication, he said, the edge for steel is $4 or $5.

In the medium structural field, three new mini-mills are competing vigorously with imports. This has meant meeting import prices that have been as much as $150 a ton under the official domestic level.

The effect of pricing on specialty volume is difficult to identify because so many things are happening at the same time. There are, for example, market gains based primarily on functional considerations.

In this connection, Mr. Simmons notes that stainless is benefitting from the automotive "drive toward quality and durability." To get better performance from small engines, the auto companies are going to higher temperatures. This has meant extensive use of stainless in the exhaust systems.

"Several models are switching over to 100 pct stainless including the exhaust manifold," said Mr. Simmons.

Other factors include the strong recovery of the consumer market, the slow improvement in capital goods, increased defense spending, and the imposition of import quotas on tool steels, stainless rods and stainless bars.

The various elements have produced some degree of improvement in all the specialty grades, including the aerospace alloys. "Quite frankly, our mills at Reading and Bridgeport are busy now, operating at about 90 pct of capacity," said Paul R. Roedel, president of Carpenter Technology. Carpenter makes such products as stainless bars and related steel goods.

Inventory Adjusting

In most product lines, there is now a pause as users do some inventory adjusting. Mill officials believe the basic trend is still upward.

Stainless flat rolled has had a sensational year so far. "When you throw in imports, we were shipping at over a million ton annual rate in the first quarter," said Mr. Simmons.

This surge was triggered by consumer durables, but stainless rose much more than durables. There was inventory building and a correction is now being signaled.

"We had a sharply declining order rate in April and May," said Mr. Simmons. "There's an inventory adjustment going on."

The inevitability of this adjustment shows up in a chart which plots stainless flat rolled shipments against consumer durables output.

This chart also shows a changing relationship. After tracking very closely in earlier years, the stainless curve has consistently topped the durables curve since 1979. The current gap is exaggerated by inventory, but there has been a gap in some periods of stable inventory.

"What this reflects in my opinion is the increased market share of stainless in consumer durables," said Mr. Simmons. He thinks price has been one factor in the increase.

None of this means the destructive competition of the last two years has reflected a voluntary trading of price for volume. "You're not going to make it up on volume when you're giving the product away," said David M. Roderick, chairman of United States Steel Corp.

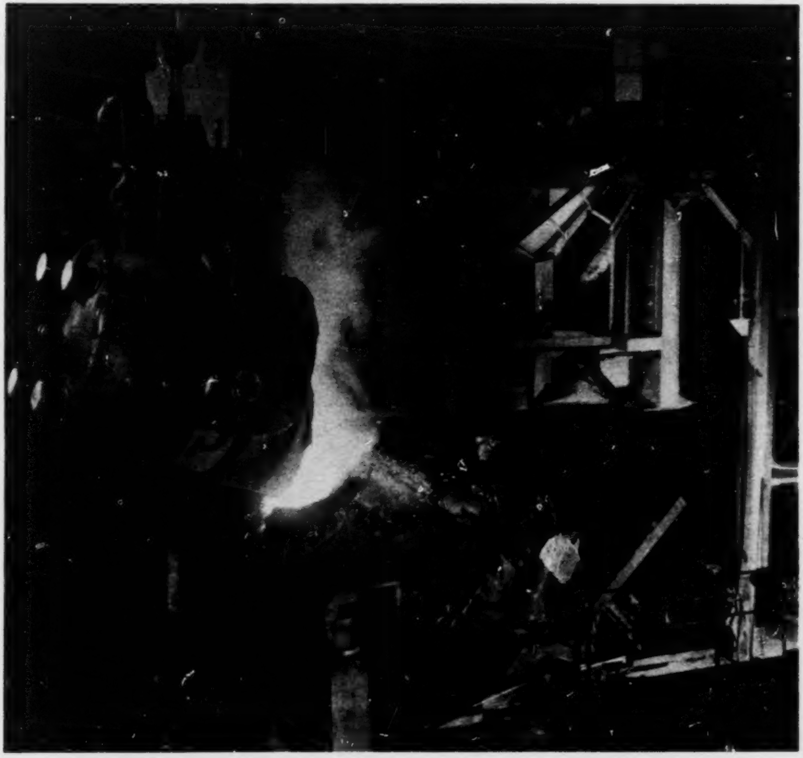
The mills are now trying desperately to get their prices up to profitable levels. Steel producers would like to make a little money, but there is growing awareness that cost-plus pricing is a thing of the past.

"If you want to survive, you'd better get efficient," said Mr. Simmons, "and if you want orders, you'd better be price competitive."

Specialty producers feel they have been living by these precepts for some time. The industry's competitive instincts are shown in one major product group.

"Stainless rod and bar have improved significantly," said Dr. Lena.

Steelmaking at Allegheny Ludlum's Brackenridge facility is benefitting from the automotive drive for quality and durability.



Volume is back close to the levels of 1978 and 1979, he said, but prices remain at 1982 levels.

With regard to efficiency, the specialty people feel they have demonstrated their world leadership. In countless speeches and presentations, they have argued that low import prices are based on government subsidies, not technical superiority.

Cited as an example of U.S. leadership is the AOD process for stainless steel. This was developed in this country and first used here.

"It's been accepted throughout the world," said Joseph M. Fallon, director of manufacturing for Joslyn Stainless Steels.

Joslyn, which was one of the earlier AOD pioneers, has shared in the recovery of the stainless bar and rod market. Like most others, Joslyn is now experiencing an order dip.

Foreign mills still haven't caught up with U.S. producers on AOD, said Dr. Lena. He said this process is used for 90 pct of the U.S. stainless compared to 70 pct abroad.

A further extension of secondary refining is now underway at Latrobe Steel Co. Latrobe is using an AOD installed last year for tool steels and vacuum melted alloys.

"We're putting everything through," said Marshall Schober, president of Latrobe. Latrobe went to AOD, said Mr. Schober, partly because the "specs for aircraft structural alloys were headed in that direction.... It's upgraded the quality of aircraft structurals."

The duplex treatment is being used to increase yields, reduce materials costs and provide greater precision. "All air melting means to us now is liquifying," said Mr. Schober.

He said the revived aerospace business has provided a strong lift for vacuum melted alloys. This has been mostly defense work but the commercial end of the market is starting to move up.

Tool steels are in an early stage of recovery. "There has been an improvement over the past six months," said Charles H. Emery, president and general manager of Braeburn Alloy Steel. "We wouldn't consider things rosy yet."

Tool Steel R&D

Mr. Emery sees significant new technology for tool steels in the form of powder metallurgy and metal coatings.

At Jessop Steel Co. demand for stainless plate is up 20 pct from last year. "Business is better than it's been in a couple of years," said C.R. Moulton, commercial vice president for Jessop. "We're very pleased so far with our performance."

Mr. Moulton called demand for cold work tool steels "very strong". Like most other specialty producers, he reported an order dip in May.

Also dipping in May were orders for stainless sheet at the Butler, Pa., plant of Armco Inc. "We're seeing some softening of stainless flat rolled," said David E. Todd, president of Armco's specialty division. "It could be inventory."

At Baltimore, Armco produces stainless and other alloys in bar form. "We think that market is on the upswing," said Mr. Todd.

The Baltimore plant recently began operating a precision rotary forge. "It's done everything we expected," said Mr. Todd. "We're quite happy with it." (Carpenter Technology and Teledyne Allvac have also installed big rotary forges.)

The Baltimore plant is operating the nation's first horizontal continuous caster. Mr. Todd indicated progress had been satisfactory, but that the plant was still in the break-in stage.

"We have had to make some design changes," he said.

Armco's Butler plant continuously casts all the slabs for its flat rolled products. All the domestic producers except Republic Steel use continuous casting for stainless sheet and strip.

"I would estimate that over 70 pct of the stainless steel in the United States is continuously cast," said Mr. Simmons of Allegheny Ludlum.

He went on to enumerate some of the lesser known technical advances. "I'm talking about the myriads of programs we have for least-cost charge, for alloy shaving, for increasing the speed of annealing lines," he said. "Hell, we make stainless steel for less than nine man hours a ton."

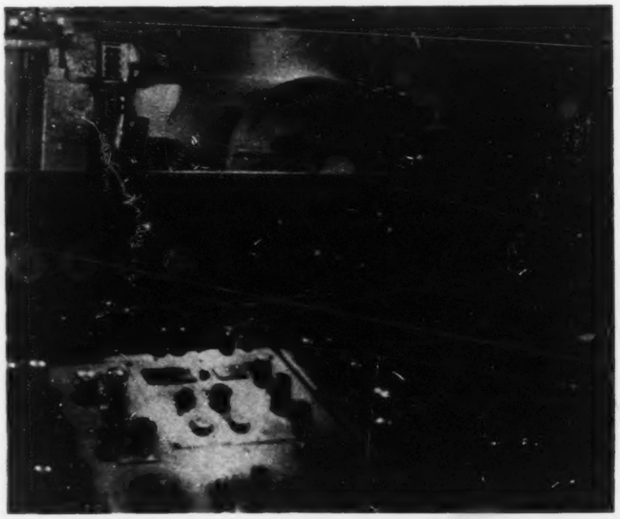
STAINLESS & TOOL STEEL SHIPMENTS 1973-1983

(thousands of net tons)

Year	Stainless	Tool Steel	Stainless Imports
1983	1,137	46	190
1982	894	44	203
1981	1,163	67	191
1980	1,127	79	153
1979	1,361	95	169
1978	1,191	92	200
1977	1,118	85	178
1976	1,019	76	175
1975	757	69	167
1974	1,345	113	176
1973	1,134	111	128

Source: AISI

Photo below shows Allegheny Ludlum's New Castle, Ind., Sendzimir reversing cold mill for stainless steel.



Mergers

The specialty companies are very much involved in the steel industry's restructuring. Armco has consolidated its bar, sheet, and electrical operations under Mr. Todd at Butler.

Allegheny Ludlum has acquired Guterl Special Steel Corp., which was bankrupt. It might appear that Allegheny Ludlum is coming full circle. The company shed its stainless bar division, which became Al Tech. Now, it seems to be acquiring a similar operation.

Mr. Simmons said this appearance was misleading. "We don't intend to make bar or rod," he said. "We intend to make superalloys and electronic alloys." The Guterl plant will be able to supply Allegheny Ludlum with vacuum melted and electroslag melted semifinished.

One big consolidation came when Jones & Laughlin Steel Corp. acquired the Midland, Pa., plant of Crucible Steel. According to the Justice Dept., that made J&L the nation's largest producer of stainless flat rolled with more than 37 pct of domestic capacity.

The merger with Republic would have added another 9.9 pct but after antitrust objections, it was agreed that Republic should dispose of its stainless finishing operation in Massilon, Ohio. A full 20 companies have checked out Massillon. "Armco has an interest in the Massillon facility," said Mr. Todd.

Under the merger consent degree, Republic must supply Massillon with semifinished stainless for 10 years. Cyclops Corp., which once tried to acquire the Midland plant, has argued in court that the supply arrangement has serious flaws.

Imports

"It doesn't seem as though it's ever settled," said Dr. Lena of Al Tech.

He was talking in May about government curbs on specialty imports. After much agitation and litigation, domestic producers got the Reagan Administration to apply quotas and tariffs on imports. The program is supposed to run four years, but the mills must argue their case again in annual reviews.

This is one more chapter in a running battle that never seems to produce a permanent result. Specialty quotas were established in 1976 but lifted in 1980. In late 1981, the domestic companies sought relief under Section 301

U. S. Specialty Steel Should Move to the Export Market

"...we see a continuing and growing world need for specialty steels and metals.

The inherent properties of specialty steels will continue to be required to meet critical applications in the existing delivery systems and in the developing systems designed to meet growing human needs throughout the world.

The question to be answered by the specialty steel industry of the United States is: Will this modern, competitive, technically up-to-date part of the world specialty steel industry be able to maintain its position of eminence and participation in that growth?

Our judgments say, yes, but it will not be easy, and it must be a cooperative. Let me make a case for the true economic competitiveness of specialty steel produced in the United States.

It is true that many of the critical raw materials consumed in making specialty steel are not indigenous to the United States. It is also true that the source of supply for certain of these material can be relatively unstable.

Our judgment is that those raw materials, which are generally traded in dollars, will be driven into the free market because the countries of origin are very much dependent on doing so for their economic welfare and security. In that environment, our U.S. specialty steel industry can, and does, secure its raw materials without economic disadvantage compared to other producers.

In the area of energy required to convert those raw materials into steel, we are either fully cost competitive or enjoy a certain cost advantage. There is, however, a concern. The current nuclear economic fiasco we have thrust upon ourselves could reduce or eliminate some of our country economic advantage in the electrical energy area.

The third key element of cost relates to the competitive capability of the tools—plant, buildings machinery, and equipment in place in our specialty steel industry.

By any analysis, our U.S. specialty steel industry facilities are as modern, technically up-to-date and as efficient as any in the world.

Fourth and perhaps most importantly, are our people costs. It is true that the American specialty steel hourly worker is right up there with other hourly steelworkers. The employment cost per hour worked exceeds $20. Our specialty steel salaries support people are paid rates that are generally competitive in the U.S.

In 1983, steps were taken by many specialty companies to significantly reduce the rate of increase in hourly costs through August 1986. That effort was important and must be extended if we are to narrow the gap with the world and the competitive industrial rates in the U.S.

...the measure of true economic cost of labor in the product produced is impacted not only by the cost per hour worked but also the effectiveness and motivation of the person working and the efficiency of the tools the persons work with. In other words the control factor is not the cost per hour but the cost per unit or pound produced.

"We have worked hard to attain efficiencies to offset much of that higher cost per hour level.

On balance, looking at all factors, we believe our U.S. Specialty Steel Industry, measured by the true economic cost of product, is competitive. Indeed, given a better balance of economy systems in the world, our industry should be an export oriented industry."

Remarks by Paul R. Roedel
President, Carpenter Technology

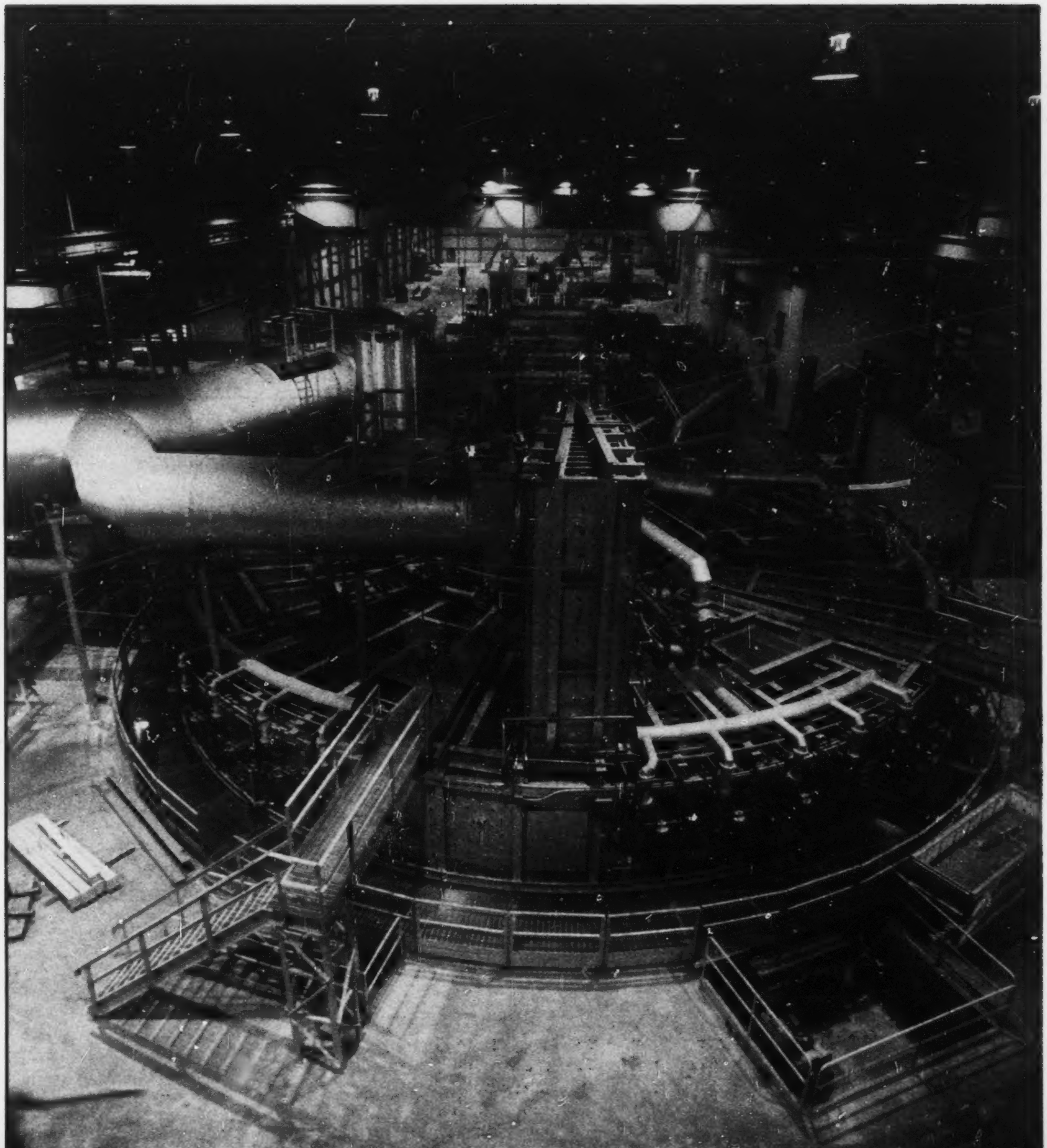
of the Trade Act.

The position of the industry was sustained by the Reagan Administration, but the remedy proposed was another long proceeding under Section 201 of the Trade Act. Finally, in July of 1983, the Administration imposed quotas and tariffs on specialty imports.

Needless to say this action brought strenuous objections from foreign specialty producers. European officials have been particularly vehement in demanding removal of the Reagan program.

"I am enraged by the ludicrous request by the Europeans to terminate this progam prematurely," said Dr. Lena. "We have proven them guilty of dumping. We have proven them guilty of subsidies. Let me suggest that they first get their houses in order."

In their 1983 drive, the domestic companies sought quotas for all products. Quotas were established for tool steel and stainless bar and rod. For stainless sheet, strip and plate, the government increased tariffs but set no



quantity limits.

The specialty companies expressed appreciation for the quotas, saying they would help, but complained that the tariffs would have no effect. It has worked along these lines.

"Certainly, the quotas are helping tool steel," said Mr. Moulton of Jessop.

The help was delayed by the low level of tool steel activity in 1983. The quota called for tool steel imports to drop from nearly 38,000 tons in 1982 to 22,400 tons in the first quota year. However, the tool steel market was so weak in 1983 that the reduced foreign tonnage remained a large percentage of the business.

With the recovery, the quota is becoming more meaningful. "It's just beginning to be effective," said Mr. Schober of Latrobe. Mr. Moulton looks for shipments of the domestic tool steel industry to rise from 45,000 tons in 1983 to 65,000 tons in 1984.

In stainless, the contrast between quotas and tariffs shows up very clearly. "There has been a definite positive impact on bars," said Mr. Todd of Armco. "The tariff on flat rolled has been ineffective."

Carpenter Technology reports that its mills are operating at 90 pct of capacity.

In the first quarter, stainless bar imports of 6,300 tons were down from 10,000 tons in the first quarter of 1983. There was a similar drop for rod.

On the other hand, stainless sheet and strip imports jumped from under 18,000 tons in the first quarter of 1983 to 30,000 tons in the 1984 quarter. The foreign flow was moderate early in the year, but it zoomed in March.

"The March numbers are just scary," said Mr. Simmons. "18,000 tons in the month of March, alone, on sheet and strip."

With their own shipments booming, however, domestic producers of flat rolled stainless might have trouble showing they are being injured by imports. The law operates on the Robin Hood theory, said Mr. Simmons.

After years of arguing in Washington, he is mildly optimistic. "We have moved from what I consider to be the educational phase to now the solution phase," he said.

There is still a hard core of opposition in what Mr. Simmons calls the "free trade Mafia." Any form of trade restraint, he said, will be opposed by the State Department, the Treasury Department, the Office of Management and Budget, the Justice Department, and the Council of Economic Advisors.

A new worry for some companies is the rise in electrical steel imports. Foreign shipments have doubled in each of the last two years.

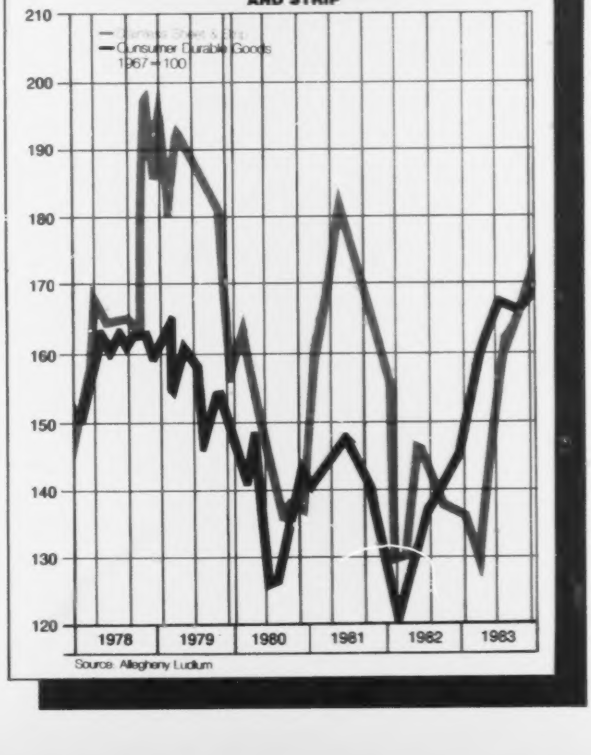
"They're approaching 6 pct of the market," said Mr. Todd of Armco.

He noted that grain oriented electrical steel was in No Man's Land as far as trade was concerned. It is not included in either the carbon steel agreements or the specialty programs.

The Japanese are among those active in rapid solidification and amorphous metals. The amorphous material is a threat, said Mr. Todd, but he noted that there is constant upgrading of the silicon steels. He has not seen anything of the 6 pct silicon steel that has been under development in Japan. A Japanese source said this had been put on the back burner. □

Reprints available while supply lasts. For single copy, circle No. 56 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1035.

CONSUMER DURABLE GOODS PRODUCTION VERSUS DOMESTIC MARKET (CONSUMPTION) STAINLESS SHEET AND STRIP

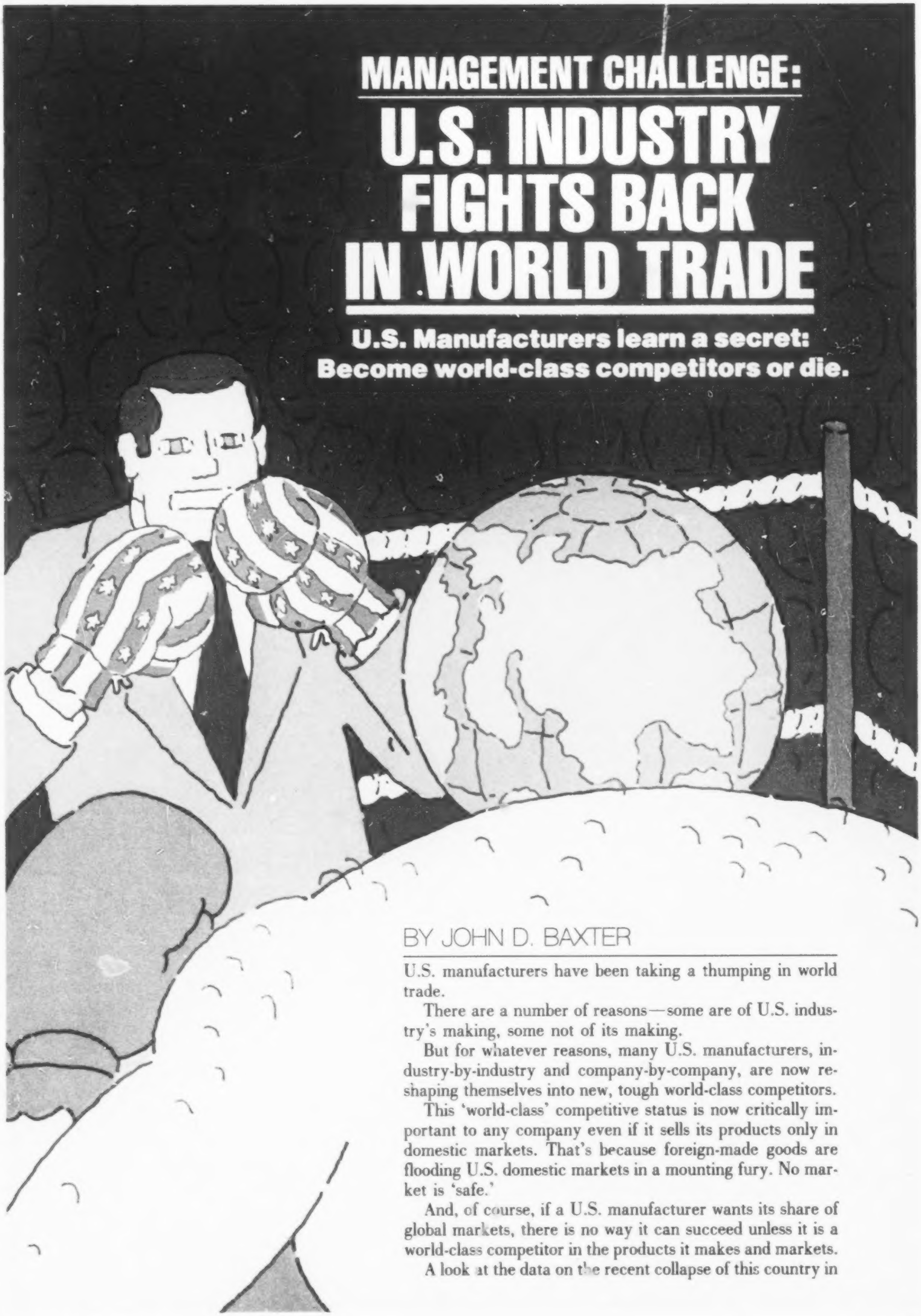


Source: Allegheny Ludlum

MANAGEMENT CHALLENGE:

U.S. INDUSTRY FIGHTS BACK IN WORLD TRADE

U.S. Manufacturers learn a secret: Become world-class competitors or die.



BY JOHN D. BAXTER

U.S. manufacturers have been taking a thumping in world trade.

There are a number of reasons—some are of U.S. industry's making, some not of its making.

But for whatever reasons, many U.S. manufacturers, industry-by-industry and company-by-company, are now reshaping themselves into new, tough world-class competitors.

This 'world-class' competitive status is now critically important to any company even if it sells its products only in domestic markets. That's because foreign-made goods are flooding U.S. domestic markets in a mounting fury. No market is 'safe.'

And, of course, if a U.S. manufacturer wants its share of global markets, there is no way it can succeed unless it is a world-class competitor in the products it makes and markets.

A look at the data on the recent collapse of this country in world trade makes it clear why U.S. companies must redefine what being competitive really means.

In the past 8 years—all 'loser' years—the U.S. ran up a trade deficit in goods totaling $255 billion. That's the amount that imports into this country exceeded exports of U.S. goods to foreigners.

It's gotten worse lately.

A single-year record $37 billion deficit was rung up in 1982.

But 1983 topped that. The country was hit with a $62 billion trade deficit.

And to top it all off, the government's own forecast of the trade deficit for this year is $110 billion.

That's bad. So bad, the world has never seen anything like it.

But that's for trade in all goods.

How about manufactured goods? That's where this country has always been king-of-the-hill. And that is the key sign of a nation's lasting trade strength.

It appears the bad times have caught up with U.S. trade in manufactured goods.

In 1980-81 the U.S., reflecting the traditional dominant strength of its manufacturing base, ran up a world trade **surplus** in manufactured goods total of $31 billion. In 1982-83, the this country ran up an unbelievable $36 billion **deficit** in manufactured goods trade.

No Escape

With the manufacturing trade balance deep in the red, more and more U.S. manufacturing executives are being dragged into the world trade arena to face the lions of foreign competition.

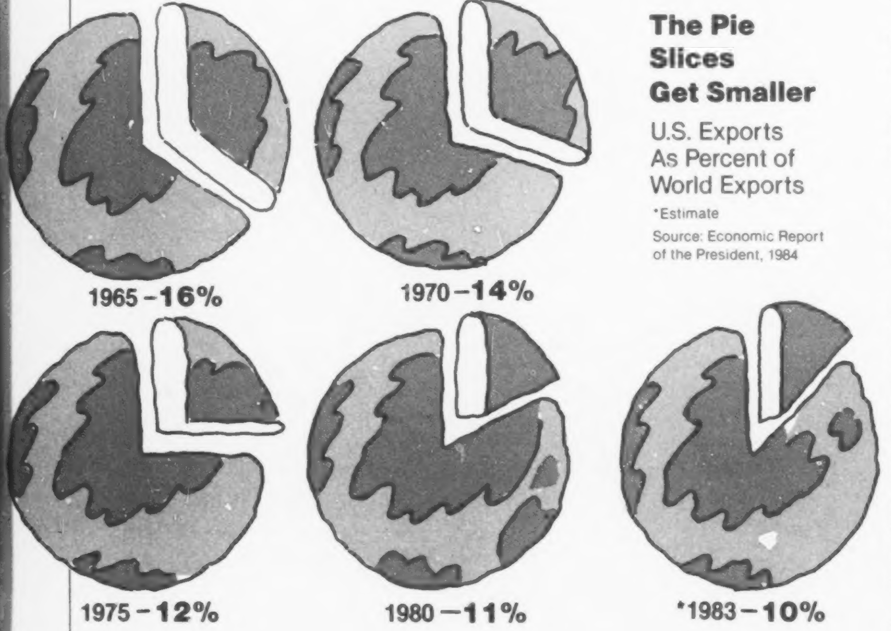
U.S. Commerce Secretary Malcolm Baldrige recently drove this point home. He said, "Overall, three quarters of all goods produced in the U.S. are subject to foreign competition—up from one-quarter a decade ago."

Added Mr. Baldrige, "And now, our last bastion of export strength—high technology—is under attack."

Bruce Scott, a Harvard University professor, has pointed out that the U.S.'s vaunted world edge in high-tech is now questionable. In a analysis he made he found that in the years 1970-80, the U.S. share of world markets in 7 of 10 key high-tech categories fell.

"U.S. exports grew rapidly in high-tech," he said, "but world markets grew even faster and the U.S. lost market share."

The U.S. is running in the red in trade with all major regions of the world, as well as in many product lines. For example, here are the annual rate deficits in U.S. trade for the first quarter this year: Non-OPEC developing countries, $39.6 billion; Japan, $30.4 billion; Canada, $15.2 billion; Western Europe, $10.8 billion; OPEC countries, $10.4 billion.



The Pie Slices Get Smaller

U.S. Exports As Percent of World Exports

*Estimate

Source: Economic Report of the President, 1984

Why the Collapse?

All the recent bad news on the U.S. in world trade points to a startling loss of competitiveness. Why the collapse? Are the tough times here to stay?

One group of top analysts that has wrestled with the problem is the President's Council of Economic Advisers. Their findings result in a resounding 'not to worry.'

The council, in its Economic Report to the President last year, looked at underlying national strengths and the long-run performance of the U.S. economy in relation to other leading industrial nations. It concluded:

"The overall performance of the U.S. ...does not suggest a long-term problem of competitiveness. The shift from persistent trade surplus to persistent deficit which occurred over the last decade is, however, often misinterpreted as a sign of an inability to compete."

The council added: "Although the recent appreciation of the dollar has created a temporary loss of competitiveness, the U.S. has not experienced a persistent loss of ability to sell its products on international markets, in fact, in the 1970's the U.S. held its own in terms of output, exports and employment.

In the council's 1984 report to the President, it pinpointed sources of the U.S. trade deficits.

The report stated that recent increases in U.S. trade deficits can be broken down into three parts.

"First, the appreciation of the dollar has made it difficult for U.S. firms to compete in world markets.

"Second, there has been a substantial loss in net exports to debt-troubled countries.

"Third, the U.S. is experiencing more rapid growth in income, and therefore, in imports, than are Europe and Japan."

The report concluded, "These three factors concern economic perturbations that, though large, are believed to be temporary."

The Killer Dollar

It is easy to see why the council listed the increased strength of the dollar as the number one cause for the recent whopping deficits in goods trade. A rising dollar makes U.S.-made goods costlier for foreigners, and it makes their goods cheaper for Americans.

"As of December 1983," stated the report, "the dollar had risen 52 pct against an average of 10 trading partners' currencies weighted by their shares in world trade, relative to the average for 1980."

The council has estimated that every 1 pct real appreciation of the dollar adds about $2 billion to trade deficits.

Most trade experts, both government and private, pinpoint the strong dollar as, by far, the leading cause for recent massive deficits in U.S. world trade in goods.

And most agree, also, that the dollar is extraordinarily strong because of high interest rates in this country relative to currencies of other nations. These high levels are a magnet that draws investments from all over the world. And that great demand for dollar assets sends the dollar up in value.

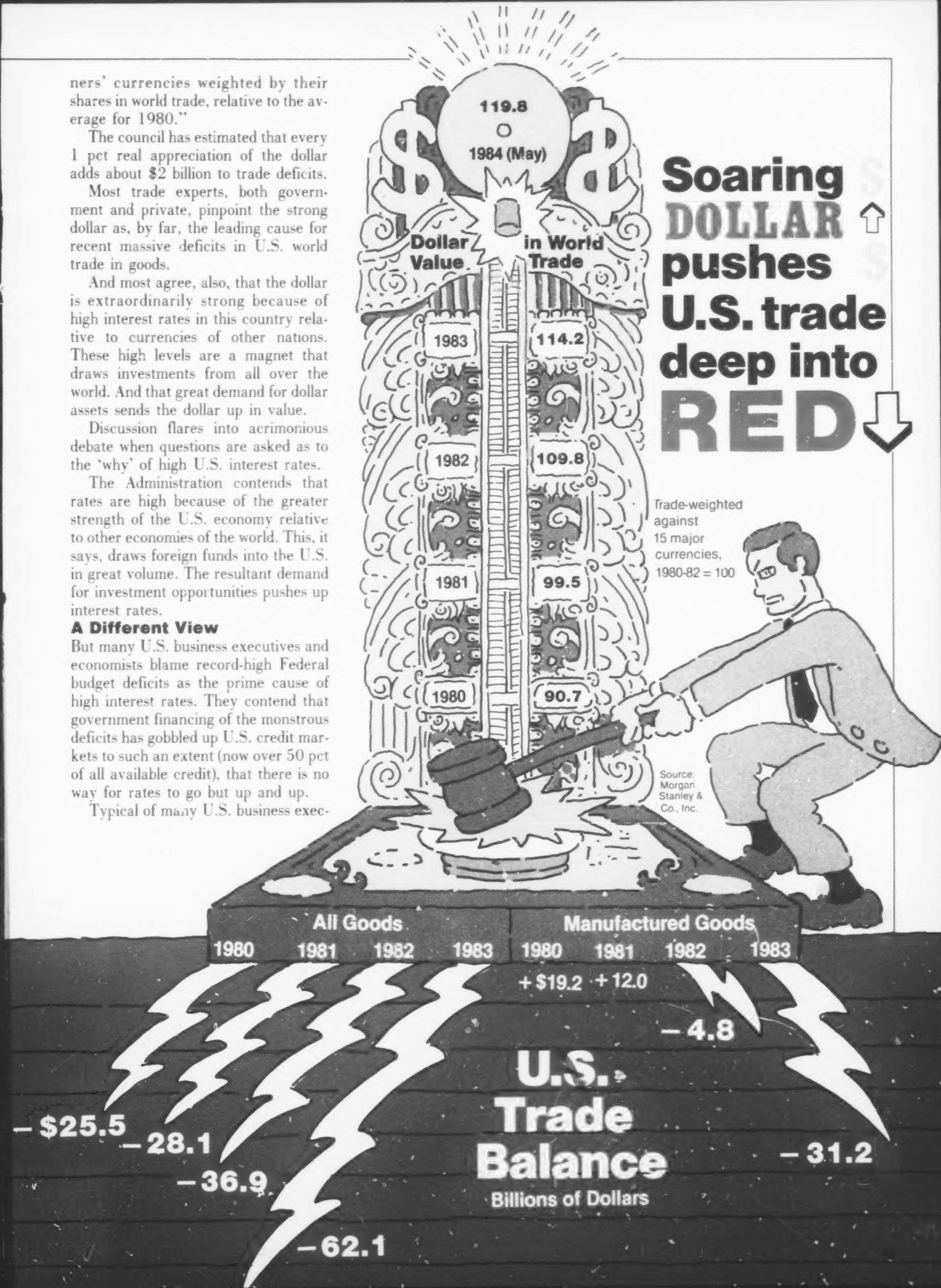
Discussion flares into acrimonious debate when questions are asked as to the 'why' of high U.S. interest rates.

The Administration contends that rates are high because of the greater strength of the U.S. economy relative to other economies of the world. This, it says, draws foreign funds into the U.S. in great volume. The resultant demand for investment opportunities pushes up interest rates.

A Different View

But many U.S. business executives and economists blame record-high Federal budget deficits as the prime cause of high interest rates. They contend that government financing of the monstrous deficits has gobbled up U.S. credit markets to such an extent (now over 50 pct of all available credit), that there is no way for rates to go but up and up.

Typical of many U.S. business exec-



Soaring DOLLAR ⇧ pushes U.S. trade deep into RED ⇩

Trade-weighted against 15 major currencies, 1980-82 = 100

Source: Morgan Stanley & Co., Inc.

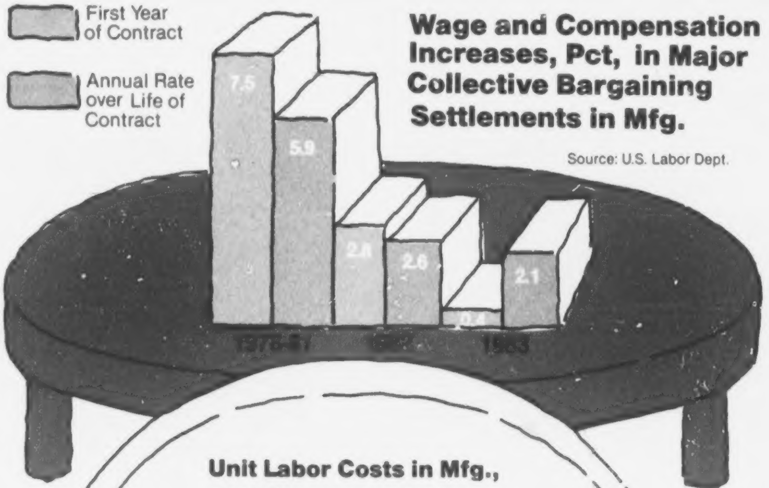
utives who subscribe to this view is Edson W. Spencer, chairman of Honeywell Inc. and head of the Business Roundtable's Advisory Council on Japan-U.S. Economic Relations.

"The most important action Congress can take to improve international competitiveness," he said, "is to reduce Federal budget deficits."

If dollar appreciation is the chief villain in wrecking U.S. trade, that certainly means the trade problem is not is not of the making of U.S. industrial managers.

Still, it makes little difference to U.S. manufacturers whether the world trade problem is of their making or not. They know as managers of individual companies, they must deal with things as they are. And the world competition is so critical to them that they must find ways to move fast to stay alive.

And U.S. manufacturers are moving—quickly and in big ways. In years past, the extent of U.S. companies 'going international' was to try to export more or to start up a small plant overseas. That's not enough in today's environment and the across-the-border slugging trade wars.



Wage and Compensation Increases, Pct, in Major Collective Bargaining Settlements in Mfg.

Source: U.S. Labor Dept.

Unit Labor Costs in Mfg., Pct Changes, 1981-82

	National Currency	U.S. Dollar
U.S.A.	+ 13.8	+ 13.8
Canada	+ 29.2	+ 22.4
Japan	− 0.1	− 9.5
Belgium	+ 3.3	− 34.1
Denmark	+ 12.3	− 24.2
France	+ 26.2	− 19.1
Germany	+ 9.1	− 18.4
Italy	+ 37.5	− 13.1
Netherlands	+ 5.8	− 21.4
Norway	+ 21.4	− 7.2
Sweden	+ 16.8	− 21.4
U.K.	+ 15.5	+ 13.2

Source U.S. Labor Dept

The New Warriors

Today, some U.S. manufacturers are completely restructuring their companies to 'go global'—and to become world-class competitors.

This is too much for most companies. More are turning to joint ventures, licensing agreements and the like. Joint ventures are really the hallmark in the drive for U.S. manufacturers to become world-class competitors.

An outstanding example of corporate restructuring to deal with the new 'one world era' is seen in Allegheny International, Inc. As chairman Robert J. Buckley said, "We changed in a few short years from a $450 million enterprise engaged principally in special metals to a global enterprise with $2.3 billion in sales."

He added, "We are in the business of manufacturing 'world class' products...and marketing them...on a global basis."

A case study of a company being restructured—in a different way and on a different scale—is seen at Russell, Burdsall & Ward Corp. When 61 pct of the industrial fastener market was grabbed off by imports, company president Jack Lohrman, sharply reduced its manufacturing operations and became a major distributor of both U.S. and foreign fastener producers. Today, 40 pct of its total sales come from distribution activities.

Still, for more companies the way to go has been through the joint venture.

Borg-Warner Corp. is one company that is turning to the joint venture idea. Chairman James F. Bere recently, in announcing an agreement with Clark Equipment Co., commented:

"Manufacturing and marketing are increasingly on a global scale,rather than within national boundaries.

"Combining companies in similar lines of business—whether within a single country or from more than one country—may be the best formula for survival and success in the worldwide competition that already exists and which will increase in the future."

Borg-Warner is currently exploring the possibility of a combination with Clark Equipment Co. to make and market manual transmissions. Clark itself is talking with Volvo BM AB (the construction equipment unit of Sweden's Volvo group), with the idea of combining their businesses into a new joint venture company.

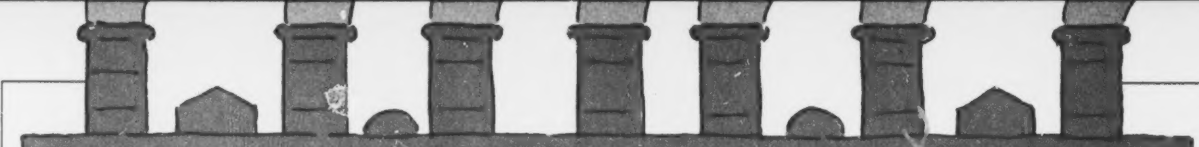
Clark is making this international move because its chairman and CEO, James R. Rinehart found that, "Clark, along with much of American industry, has a 40 pct cost disadvantage compared to the low-cost, quality world competitor."

In driving this point home recently, he noted that, "Clark may be the only domestic lift truck manufacturer in a few years."

Mixed Counterattack

The very large U.S. manufacturers often have a number of joint ventures in action. General Motors, for example, has equity interest in the Japanese auto companies of Suzuki and Isuzu. And, of course, it has its well-publicized 50-50 joint venture with Toyota Motor Co. set to produce small cars in California. More than that, GM has an agreement with South Korea's Daewoo Motors, Ltd. to produce GM-labeled cars in that country.

Or, for another perspective in the wild border-crossing game in world competition, look at American Motors Co. (AM). Half-owned by France's Renault Co., AM has a joint venture to



Metals & Metalworking, U.S. Trade Balance, Billions of Dollars

	1982	1983
Total, USA Mfgd. Goods	– $4.8	– $31.2
Metalworking Machinery	– 0.3	– 0.4
General Industrial Machinery	+ 5.0	+ 3.1
Office Machinery, Computers	+ 5.9	+ 4.9
Telecommunication, Sound & Reproducing Equip.	– 5.2	– 7.5
Autos, Buses & Trucks	– 11.1	– 14.3
Iron & Steel Mill Products	– 7.1	– 4.9
Nonferrous Metals	– 3.6	– 5.8
Total, Machinery & Metals	– 1.9	– 17.7

Source: U.S. Commerce Dept.

make jeeps in China. It buys its truck diesels from Nissan. And Nissan has started assembling cars in Japan for Volkswagen.

It is little wonder that one auto industry analyst says that of the 30 companies that make cars in the world, less than half are expected to be around at the turn of the century.

Caterpillar Tractor Co.'s Towmotor Division has agreements with Daewoo Heavy Industries, Ltd. of South Korea to manufacturer lift trucks of Caterpillar design and quality standards. Dealers will sell them under Caterpillar trademarks.

Towmotor is also having large lift trucks made by a Norway producer, and excavators made in W. Germany.

"These steps," said a Caterpillar spokesman, "allow Caterpillar to offer quality products at acceptable prices."

It is this combination of price and quality that domestic manufacturers can't always pull out of the hat on their own. Then they must find a world source where they can buy—and then resell—the product, or join with another company to produce a product with a winning combination.

Shop the World

World sourcing—or shopping the world for the best buy—is now practiced with a vengeance by U.S. manufacturers. It is often no longer just a matter of importing parts or components for a U.S.-made end-user product; it is often a matter of bringing in the whole product.

Onan Corp., a subsidiary of McGraw-Edison Co., has agreed to buy large industrial diesel engines on an original equipment manufacturer basis from Japan's Komatsu Ltd. The agreement starts with 500 units in 1984, then up to 2500 per year eventually. The object: A more world-competitive Onan Corp. in price.

Too, Waterbury Farrell Co., a subsidiary of Textron Inc., shopped worldwide and eventually bought large surface grinders from Nippei Industrial Co. The grinders will be marketed under the Waterbury Farrell brand name. Company executives say the move was made to attain "price competitiveness."

U.S. steel producers are playing the joint venture game with the best of them in their efforts to become more world-competitive in home markets. One case very recently was seen when Wheeling-Pittsburgh Steel Corp. and Nisshin Steel Co., Ltd., bought minority interests in each other.

And National Intergroup, Inc. (NII), has a new 50-50 joint venture with Nippon Kokan which paid $292 million for half interest in NII's steel operations. Other materials beyond steel may eventually be produced by this new venture.

Mergers also strengthen a company's hand in world competition also. The LTV-Republic Steel merger created the nation's second largest steel producer and a tougher company for offshore competitors to face.

Technology Helps

Many U.S. manufacturers have turned to state-of-the-art technology to reduce product costs and raise quality levels and find their places in the sun in the world trade arena. General Electric Co., in its touted Erie, Pa. locomotive plant, for example, has cut production time for traction motors from 16 days to 16 hours.

Too, GM, at its Saginaw Steering Gear Div., is at work on an automated plant set for full production by 1987. It will have the capability of running almost unmanned. Daniel Stainforth, manager of the project, cited "competitive problems in world markets" as the GM motivation in setting up the plant.

GM is not letting up on this modernization drive. The company knows, probably as clearly as any U.S. manufacturing company, that the name of the game is world competition, not intra-industry competition. Recently, GM chairman Roger B. Smith noted that the company spent $33 billion worldwide for plant and equipment from 1979 through 1983.

"This capital," he said, "will assure that we have the products, facilities and financial resources necessary to be successful in worldwide competition."

So, U.S. manufacturers fight back against imports—sometimes by creating imports—but still surviving, and even growing, in the world competitive marketplace.

The long list of ways includes, very importantly, progress in getting labor costs under better control than ever in the past. Charts in this article show U.S. labor costs in manufacturing in a startling falling pattern. Also, in relation to world trading partners—when effects of the bloated dollar are excluded—U.S. manufacturers has done a superior job in containing labor cost (see charts).

Too, a precedent could be set by GM's request to vendors to cut their prices by 3.3 pct over the next 3 years. GM's reason: "Necessity to compete with foreign producers." ☐

Reprints available while supply lasts. For single copy, circle No. 62 on Inquiry Card. Additional copies, $1, for articles up to eight pages. Longer ones $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write IRON AGE, Reader Service, Chilton Company, Radnor, Pa. 19089. Ask for Reprint No. 1031

PRICE & PRODUCTION DATA

(Effective June 11, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	245	264	247	210
Pittsburgh	259	287	298	190
Youngstown	121	116	102	94
Lake Erie	159	160	155	121
Detroit	162	161	174	129
Chicago	503	550	581	463
Cincinnati	109	82	124	95
St. Louis	86	88	89	67
Southern	218	225	238	136
Western	91	94	90	86
U.S. Production	1,953	2,027	2,110	1,621

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective June 11, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,953	2,027	45,863	35,173
Capability Utilization Rate	75.2	78.0	77.0	52.8

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 5/14/84)	27.405	27.405	27.405	26.217
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 85.17	$ 85.17	$ 89.50	$ 70.83
No. 2 bundles	$ 56.83	$ 56.83	$ 60.17	$ 46.50

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 94.50	$ 94.50	$100.50	$ 72.50
No. 1 steel, Philadelphia	80.50	80.50	82.50	68.50
No. 1 steel, Chicago	80.50	80.50	85.50	71.50
No. 1 bundles, Detroit	87.50	87.50	92.50	71.50
Low Phos., Youngstown	89.50	90.50	98.50	75.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	74.50
No. 1 mach'y cast., Phila	98.50	100.50	100.50	98.50
No. 1 mach'y cast., Chi	117.50	117.50	117.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective June 11, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	69.00-70.00	68.00-70.00	6/6/84
Lead	26.00-28.00	25.00-28.00	6/1/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	52.00-53.00	53.00	5/3/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$2.25
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$382.50
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$322-$330
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.80
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

June 4—575.30
June 5—574.91
June 6—Holiday
June 7—573.98
June 8—574.37

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64	63½
Yellow brass	59¾	59¾
Red brass	61	61
Comm. bronze	61¼	61¼
Mang. bronze	58	54¼
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	61
No. 2 copper wire	51
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	57
No. 2 copper wire	47
Light copper	58
No. 1 composition	56
No. 1 comp. turnings	54
Hvy. yellow brass solids	38
Hvy. yellow brass turnings	36
Radiators	46

Aluminum

New mixed clips	45	—46
Old sheet	42	—43
Old cast	42	—43
Clean dry borings	43	—44

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	37	—39
Old sheets and cast	33	—34
Borings and turnings	26	—27
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	51	—52
No. 2 copper wire	42	—43
Light copper	37	—38
Radiators	36	—37
No. 1 composition	45	—46
No. 1 composition turn'gs	42	—43
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	47	—48

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	60	— 70

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE JUNE 11, 1984

(Effective June 11, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 94.00 to $ 95.00
No. 2 hvy. melting	84.00 to 85.00
No. 1 dealer bundles	111.00 to 112.00
No. 1 factory bundles (auto)	101.00 to 102.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	107.00 to 108.00
Machine shop turn	16.00 to 17.00
Shoveling turnings	52.00 to 53.00
Cast iron borings	51.00 to 52.00
Low phos. punchings plate	114.00 to 115.00
Heavy turnings	87.00 to 88.00
No. 1 RR hvy. melting	108.00 to 109.00
Rails 2 ft. and under	122.00 to 123.00
Scrap rails, random lgth	107.00 to 108.00
RR specialties	120.00 to 121.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	600.00 to 610.00
18-8 turnings	500.00 to 510.00

Chicago

No. 1 hvy. melting	$ 80.00 to $ 81.00
No. 2 hvy. melting	76.00 to 77.00
No. 1 dealer bundles	109.00 to 110.00
No. 1 factory bundles (auto)	112.00 to 113.00
No. 2 dealer bundles	59.00 to 60.00
No. 1 busheling	102.00 to 103.00
Shredder scrap	100.00 to 101.00
Machine shop turn	44.00 to 45.00
Mixed bor. and turn	45.00 to 46.00
Shoveling turnings	51.00 to 52.00
Cast iron borings	51.00 to 52.00
Low phos. forge crop	120.00 to 121.00
Low phos. punchings plate ¼ in. and heavier	131.00 to 132.00
Low phos. 2 ft. and under	125.00 to 126.00
No. 1 RR hvy. melting	102.00 to 103.00
Scrap rails, random lgth	99.00 to 100.00
Reroller rails	107.00 to 108.00
Rails, 2 ft. and under	123.00 to 124.00
RR couplers and knuckles	105.00 to 106.00
RR car axles	129.00 to 130.00
No. 1 machinery cast	117.00 to 118.00
Cupola cast	108.00 to 109.00
Stove plate	106.00 to 107.00
Steel car wheels	115.00 to 116.00
Stainless	
18-8 bundles and solids	555.00 to 565.00
18-8 turnings	455.00 to 465.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to $ 82.00
No. 2 hvy. melting	69.00 to 72.00
No. 1 dealer bundles	90.00 to 93.00
No. 2 dealer bundles	50.00 to 53.00
No. 1 busheling	90.00 to 93.00
Shredder scrap	95.00 to 98.00
Machine shop turn	29.00 to 32.00
Mixed bor. and turn	29.00 to 32.00
Shoveling turnings	43.00 to 46.00
Low phos. 5 ft. and under	95.00 to 98.00
Low phos. 2 ft. punchings	116.00 to 119.00
Electric furnace bundles	109.00 to 112.00
RR specialties	103.00 to 106.00
Rails, 2 ft. and under	117.00 to 120.00
Cupola cast	70.00 to 73.00
Heavy breakable cast	57.00 to 60.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 60.00 to $ 61.00
No. 2 hvy. melting	57.00 to 58.00
No. 1 dealer bundles	87.00 to 88.00
No. 2 bundles	40.00 to 41.00
No. 1 busheling	86.00 to 87.00
Drop forge flashings	55.00 to 56.00
Machine shop turn	47.00 to 48.00
Mixed borings and turn	26.00 to 27.00
Shoveling turnings	48.00 to 49.00
Cast iron borings	41.00 to 42.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	455.00 to 465.00
18-8 turnings	360.00 to 370.00
430 bundles and solids	110.00 to 120.00

Youngstown

No. 1 hvy. melting	$ 78.00 to $ 81.00
No. 2 hvy. melting	59.00 to 62.00
No. 1 dealer bundles	91.00 to 94.00
No. 2 dealer bundles	35.00 to 38.00
Machine shop turn	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	88.00 to 91.00
Electric furnace bundles	84.00 to 87.00
Galvanized bundles	79.00 to 82.00

Cleveland

No. 1 hvy. melting	$ 70.00 to $ 73.00
No. 2 hvy. melting	46.00 to 49.00
No. 1 dealer bundles	86.00 to 89.00
No. 1 factory bundles	92.00 to 95.00
No. 2 bundles	28.00 to 31.00
No. 1 busheling	88.00 to 91.00
Machine shop turn	13.00 to 16.00
Mixed bor. and turn	13.00 to 16.00
Shoveling turnings	15.00 to 18.00
Cast iron borings	18.00 to 21.00
Cut structural & plates, 2 ft. and under	113.00 to 116.00
Low phos. punchings plate	113.00 to 116.00
Drop forge flashings	60.00 to 63.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	120.00 to 123.00
Rails, 18 in. and under	121.00 to 124.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	109.00 to 112.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to $ 72.00
No. 2 hvy. melting	59.00 to 60.00
No. 1 busheling	84.00 to 85.00
No. 1 dealer bundles	84.00 to 85.00
No. 2 bundles	39.00 to 40.00
Machine shop turn	14.00 to 15.00
Mixed bor. and turn	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	23.00 to 24.00
Low phos. plate	98.00 to 99.00
Structural and plate, 2 ft. and under	98.00 to 99.00
Rails, 2 ft. and under	94.00 to 95.00
Scrap rails, random lgth	74.00 to 75.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 75.00 to $ 76.00
No. 2 hvy. melting	64.00 to 65.00
Foundry steel, 2 ft.	71.00 to 72.00
No. 1 dealer bundles	75.00 to 76.00
No. 2 bundles	61.00 to 62.00
Machine shop turn	20.00 to 21.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	29.00 to 30.00
No. 1 RR hvy. melting	75.00 to 76.00
Rails, random length	77.00 to 78.00
Rails, 18 in. and under	94.00 to 95.00
RR specialties	92.00 to 93.00
Cupola cast	74.00 to 75.00
Heavy breakable cast	53.00 to 54.00
Stove plate	88.00 to 89.00
Cast iron car wheels	54.00 to 55.00
Rerolling rails	87.00 to 88.00
Unstripped motor blocks	59.00 to 60.00

Birmingham

No. 1 heavy melting	$ 79.00 to $ 80.00
No. 2 heavy melting	74.00 to 75.00
No. 1 dealer bundles	79.00 to 80.00
No. 2 bundles	57.00 to 58.00
No. 1 busheling	79.00 to 80.00
Shredder scrap	96.00 to 98.00
Machine shop. turn	37.00 to 38.00
Shoveling turnings	48.00 to 49.00
Cast iron borings	48.00 to 49.00
Electric furnace bundles	70.00 to 71.00
Elec. furnace, 3 ft. & under	75.00 to 76.00
Structural and plate, 2 ft.	103.00 to 104.00
Structural and plate, 4 ft.	94.00 to 95.00
No. 1 RR hvy. melting	94.00 to 95.00
Scrap rails, random lgth	87.00 to 88.00
Rails, 2 ft. and under	107.00 to 108.00
Angles and splice bars	94.00 to 95.00
No. 1 cupola cast	90.00 to 91.00
Unstripped motor blocks	70.00 to 71.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to $ 68.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 dealer bundles	80.00 to 81.00
No. 2 bundles	39.00 to 40.00
Machine shop turn	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	25.00 to 26.00
Low phos. 18 in. and under	99.00 to 100.00
Rails, random length	80.00 to 81.00
Rails, 2 ft. and under	95.00 to 96.00
No. 1 cupola cast	68.00 to 69.00
Heavy breakable cast	35.00 to 36.00
Drop broken cast	88.00 to 89.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 52.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn	11.00 to 13.00
Machine shop turn	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	505.00 to 525.00
18-8 turnings	400.00 to 420.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to $ 66.00
No. 2 hvy. melting	55.00 to 56.00
No. 1 dealer bundles	70.00 to 71.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	75.00 to 76.00
Shredder scrap	73.00 to 75.00
Machine shop turn	14.00 to 16.00
Shoveling turnings	20.00 to 22.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to $ 47.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	35.00 to 37.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to $ 48.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	36.00 to 38.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn	10.00 to 12.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	42.00 to 44.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	82.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	54.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn	45.00
Short steel turn.	43.00
Mixed bor. and turn	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 78.00 to $ 79.00
No. 2 hvy. melting	64.00 to 65.00
No. 2 bundles	42.00 to 43.00
Machine shop turn	16.00 to 17.00
Crushed turnings	39.00 to 40.00
Shredder scrap	80.00 to 81.00
Cut structural plate, 2 ft. and under	103.00 to 105.00
Cut structural plate, 5 ft. and under	92.00 to 94.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	80.00 to 81.00

DEFENSE ORDERS RETREAT IN APRIL

Is the air coming out of the nation's economic balloon?

The defense orders part of the country's durable goods orders for April dropped enough to cause pessimists to answer yes to the question. And overall new orders for durable goods dropped 7.5 pct to $97.6 billion compared with March's $104.9 billion.

U.S. Commerce Secretary Malcolm Baldrige said the the country is entering "a more moderate, sustainable growth period" after experiencing 18 months of vigorous rebound.

Capital goods new orders without the defense quotient declined 4.3 pct to $25.8 billion versus $26.9 billion in March, the Commerce Dept. said. Most of the categories declined in April with some notable exceptions.

For example, machine tools new orders rose 22.5 pct to $255.8 million compared with $208.4 million in March. Metal cutting machine tools orders were up 24.5 pct in April to $182.5 million versus $146.5 million the previous month. Metal forming machine tools new orders were up 41.2 pct to $73.3 million compared with $51.9 million in March.

Unchanged compared with March were April new orders for steel ($4.7 billion), metalworking machinery ($8 million) and shipments of farm machinery and equipment ($9 million).

Commerce said inventory rebuilding continued to be strong in April as stocks increased 1.5 pct, the same as in March. Factory inventories have grown 4 pct since January.

Within the major industries declines showed up for transportation equipment and machinery. About three-fourths of the $4.6 billion drop in transportation orders was in aircraft and the rest in autos, an industry undergoing a model year changeover.

A significant increase was in orders for primary metals, mostly aluminum and copper, up 5.3 pct after four months of declines.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	1st Qtr.	$332.7	$318.8	$293.0
Manufacturing, Total	1st Qtr.	124.7	116.4	109.9
Manufacturing, Durable Goods	1st Qtr.	59.2	54.9	50.7
Mining Industry	1st Qtr.	13.6	12.4	12.0
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Apr.	97.6	104.9	83.0
Shipments	Apr.	95.0	97.0	80.4
Inventories	Apr.	178.4	176.0	169.9
Unfilled Orders	Apr.	340.0	337.4	299.0
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Apr.	25.8	26.9	20.3
Capital Goods Producers, Defense Industries	Apr.	6.4	11.5	4.8
Primary Metals, Total	Apr.	11.9	11.3	8.9
Steel (SIC 331)	Apr.	4.7	4.7	3.5
Iron & Steel Castings (SIC 332)	Apr.	1.4	1.3	1.0
Nonferrous Metals	Apr.	5.8	5.3	4.4
Nonelectrical Mach.-Equip. Industries, Total	Apr.	16.8	18.3	14.8
Engines & Turbines	Apr.	1.1	1.2	0.9
Farm Machinery & Equipment (Shipments)	Apr.	0.9	0.9	0.9
Construction, Mining & Mat. Hdlg. Equip.	Apr.	2.6	2.7	2.1
General Industrial Machinery	Apr.	1.4	1.3	1.1
Fluid Power Equipment** (Index-1972=100)	Apr.	313.0	336.0	210.0
Metalworking Machinery	Apr.	0.8	0.8	0.6
Machine Tools, Total ($ Mill., Unadjusted)***	Apr.	255.8	208.4	118.5
Machine Tools, Metalcutting***	Apr.	182.5	146.5	79.2
Machine Tools, Metalforming***	Apr.	73.3	51.9	39.3
Electrical Mach. & Equip. Industries, Total	Apr.	14.8	16.9	13.2
Elec. Transmission Equip. & Ind. Apparatus	Apr.	2.0	2.1	1.8
Household Appliances	Apr.	1.3	1.4	1.2
Communication Equipment	Apr.	4.2	5.7	4.4
Transportation Equip. Industrial, Total	Apr.	23.8	28.4	20.0
Motor Vehicles & Parts (Shipments)	Apr.	14.6	15.9	11.3
Aircraft, Missiles & Parts	Apr.	7.9	11.3	6.9
Shipbuilding & Military Tanks	Apr.	0.4	0.5	0.8
Fabricated Metal Products, Total	Apr.	10.8	10.9	9.5
Instruments, Total	Apr.	4.8	4.6	4.1

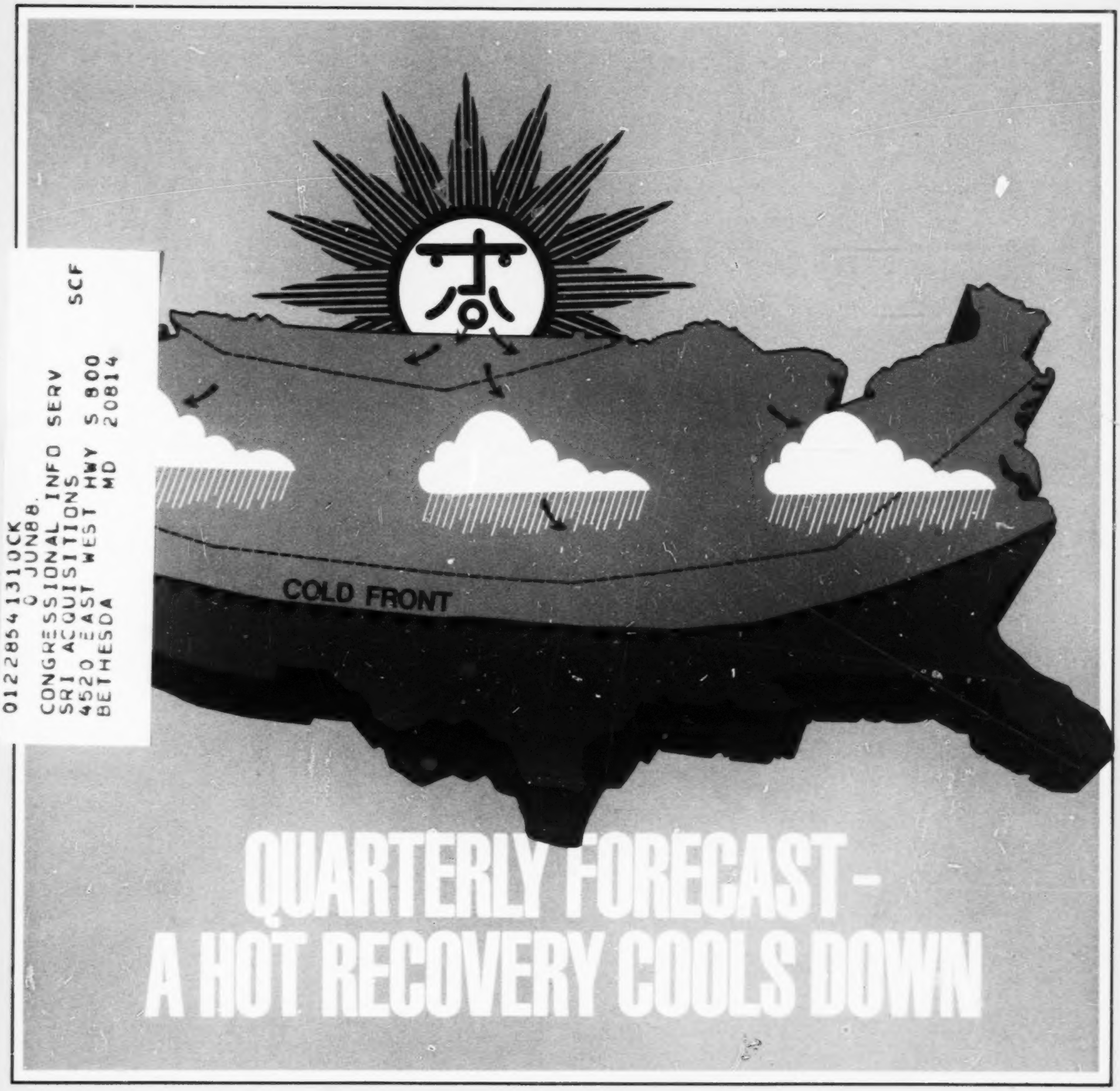
*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

C2150-2

CHILTON'S

July 2, 1984

IRONAGE
METALS PRODUCER



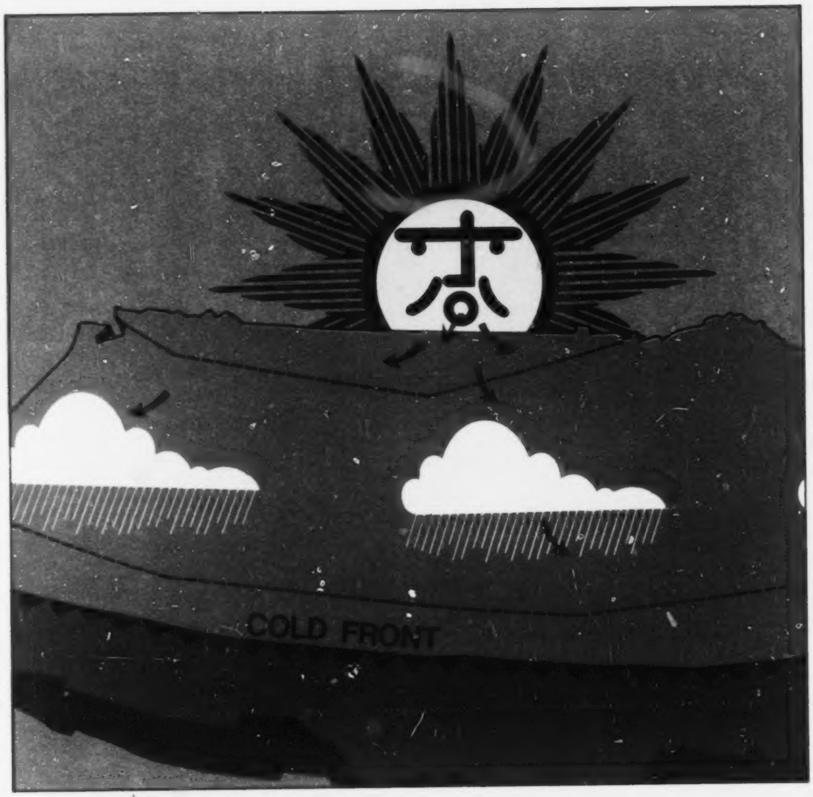
0122854131OCK SCF
O JUN88.
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

QUARTERLY FORECAST – A HOT RECOVERY COOLS DOWN

STEEL LICKS THE POLLUTION PROBLEM . . . FOR NOW
PLUS THE HOT SPOT

JULY 2, 1984 VOL. 227, NO. 13

CHILTON'S
IRONAGE
METALS PRODUCER



Editorial 7
O'er the ramparts we watched . . . and watched.

Newswatch 13
Alcan's purchase of Arco Aluminum runs into a hurdle.

The Hot Spot 23
Protectionism hurts, too!

Third Quarter Forecast 28
The recovery's current cooling will prevent burnout.

Pollution Control 56
No indications the laws will relax in the 1980s.

Trade Adjustment Assistance 61
It's a beacon of hope for many unemployed workers.

Materials Report 65
Steel producers revise their estimates for 1984.

Price Trends 76
Prices on an even keel in May.

Next Issue: World Continuous Casting Report.

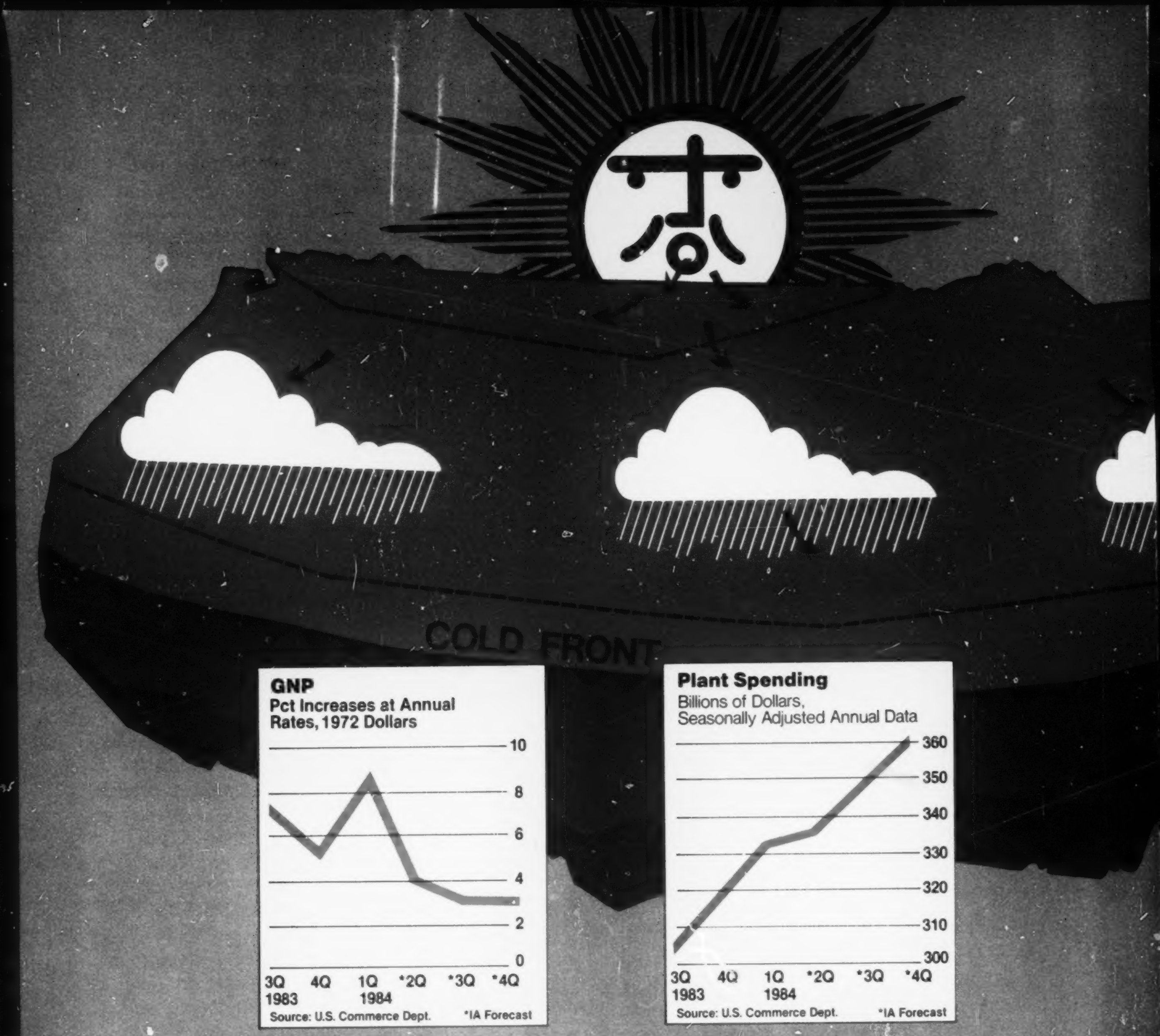
Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 11
INDUSTRIAL BRIEFS 20
PRODUCT & EQUIPMENT REVIEW 64
AD INDEX 66
MANAGEMENT SERVICE CARD 67
P&P DATA 6/18 70
FERROUS SCRAP 6/18 71
STEEL PRICES 72
STEEL PRICES 73
CLEARING HOUSE 74

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

ONE OF THE ABC PUBLISHING COMPANIES

Chilton
abc



GNP
Pct Increases at Annual Rates, 1972 Dollars

Source: U.S. Commerce Dept. *IA Forecast

Plant Spending
Billions of Dollars, Seasonally Adjusted Annual Data

Source: U.S. Commerce Dept. *IA Forecast

A HOT RECOVERY COOLS DOWN

JOHN D. BAXTER

The U.S. business recovery is in a cooling phase.

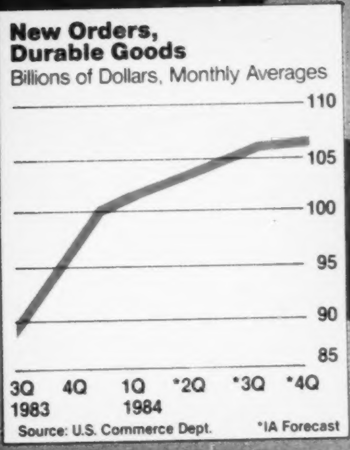
And it's a good thing it is. The way things were going, there was danger of an early burnout.

A burnout could mean an earlier-than-expected demise of the recovery. That would leave a lot of corporate latecomers to the recovery with still-languishing order books — and that includes many metalworking companies in the capital goods lines.

The recovery burnout wouldn't come because the economy was being pressed to its limits. After all, despite recent big gains posted on the GNP scoreboard, unemployment is still running at a near-8 pct level, and U.S. mills, mines and utilities are operating at only about 82 pct of capacity.

The burnout, rather, could come because of the possible buildup of excesses or imbalances in the economy. A case in point is seen in recent doings in inventories. These swung from a $15.4 billion annual rate liquidation in the first quarter last year, to a $26.6 billion buildup in the opening period this year.

The clearest evidence of cooling in the economy is seen in the recent trend in final sales. The measure, final sales, represents GNP, or total output of the economy, less changes in business inventories. In other words, final sales represent goods actually sold and delivered to users, not those goods produced but piled up on shipping platforms.


New Orders, Durable Goods
Billions of Dollars, Monthly Averages
110
105
100
95
90
85
3Q 1983
4Q
1Q 1984
*2Q
*3Q
*4Q

Source: U.S. Commerce Dept. *IA Forecast

Although the recovery seems to be cooling there remains quite a bit of sunshine out there for business. The likelihood of a deep freeze in the economy is remote in '84.

In the second quarter 1983, final sales, at a constant dollar annual rate, rose 6.8 pct. Then followed gains of 5.1 pct in third quarter, 3.7 pct in the closing period and 3.6 pct in the March period this year. Contrast these numbers with much hotter GNP increases of 9.7 pct, 7.6 pct, 5.0 pct and 8.8 pct.

It is simply a weakness of GNP as a measuring device for the economy, that inventory increases are counted as a plus factor. An inventory buildup can be bad news. This is so when stock building is involuntary on the part of business, when it has a lot of goods to sell and can't move them.

Many metalworking industry executives who watched the posting of the four most recent quarterly rises in GNP have openly wondered where all the business was going; they didn't see it happening to that extent on their own order books. After all, those quarterly GNP rise figures were of 'boom' strength. The secret is explained by bulging stocks that bulged GNP data.

Final sales, then, of late, have been a more accurate measure of economic growth than GNP. And sales show the recovery moderating, but continuing.

There is another little 'deception' going on that obscures the true strength and the nature of the recovery. This is seen in data on capital investment by business, another factor critical to metalworking industries.

The GNP scoreboard, over the past three quarters, including the opening one this year, shows growth in business fixed investment far outstripping growth of the overall economy.

In the third quarter last year, when GNP rose at a 7.6 pct real annual clip, business investment rose by almost 19 pct. And in the closing period, when GNP expanded by a 5.0 pct rate, business capital investment rose by better than 27 pct. Finally, in the first period this year, when the overall economy grew at an 8.8 pct rate, business investment grew at a near 17 pct rate.

All that implies that this country has just gone through three quarters of an out-and-out capital spending boom.

A look at three factors helps clear up the seeming illusion of the capital spending 'boom.'

First, capital investment in the last recession was hit harder than just about any other element in the economy. So, its gains now are, in a sense, magnified relative to past levels.

Too, plant spending has, as always in recovery phases, lagged. Most of the other elements of the economy have been growing since the start of the recovery 20 months ago. The measures of these elements are now moderate—certainly as compared to the rise-from-the-cellar gains of capital investment.

A second factor that explains the boomless boom in plant spending is the lopsided nature of it. Economist Joan D. Schneider of Continental Bank has noted that, "More than 55 pct of spending for equipment so far during the recovery has been concentrated in autos, trucks and computers."

Ms. Schneider also pointed to "rapid expansion of the service sector" as a magnet for much capital spending. "In contrast," she said, "investment in metalworking and heavy industrial machinery has remained subdued."

This strong trend of a changing 'mix' in capital spending has been going on for years and has reached a point where the big numbers on capital goods spending can leave old-line plant managers wondering what's going on.

The third factor that helps explain the puzzle of the recent capital spending 'boom' is seen in the growth of imports of capital goods.

One recent report indicated that in 1970, capital goods imports amounted to $4 billion. In 1983, such imports amounted to $40 billion. Imports are said to now account for 18 pct of the U.S. capital goods market.

If this recovery lasts long enough, then the order books of just about all capital goods producers will be full.

And that 'duration' possibility is the crux of the matter in the view of most business forecasters right now. The vital question: Can the economic recovery reach maturity?

Very few economists are now saying the business recovery is about to end.

Also, at this time, there are few, if any, leading measures of the economy that are throwing off negative numbers for more than one month at a time. It is chiefly a matter of slowing rates of gain. A 4 pct growth rate for the economy is the consensus forecast for 1984.

If there is a trap-door in place under the recovery, it is in interest rates. If that door is sprung by higher rates, then the recovery could go 'swoosh.'

That's not as neat and surefire a premise as it seems. After all, who would ever have thought the U.S. economy could score real GNP quarterly annual rate growth gains of 9.7 pct, 8.8 pct and 7.6 pct within a year's span when interest rates were running at double-digit levels?

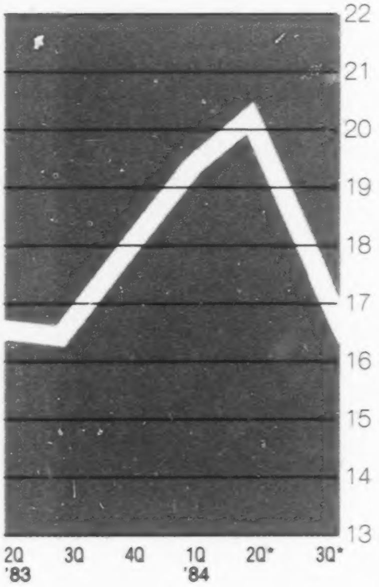
Probably the best that can be said about interest rates is that even if they rise sharply between now and the end of the year, the recovery has enough 'roll' to ride through the year.

In sum, this year looks to be safely in the bag. And the chances of an economic recovery beyond that are at least promising in view of the across-the-board capital spending programs now building up a head of steam. That's the stuff of sustained economic recoveries.

STEEL

With the national economy supposedly booming, the steel market has gone into another nosedive.

Steel Shipments
Millions of Tons



Source: AISI *IA estimate

Something has to be very wrong.

With the national economy supposedly booming, the steel market has gone into another nosedive.

Either the economy is less robust than it appears, the steel lag is less severe than it appears or it is now possible to have a steel recession in the middle of general prosperity.

The steel market is clearly receding. By late June, raw steel output had fallen 10 pct to less than 70 pct of capacity. Steel shipments are expected to fall by at least 10 pct in July and no pickup is indicated for August.

The steel dive coincided with a government estimate that the nation's output rose another 5.7 pct in the second quarter (annual rate). That was on top of a 9.7 pct rise in the first quarter. The sharp gains brought warnings that the economy might be overheating.

In this setting, the rapid cooling of the steel market was puzzling and demoralizing. After losing $6 billion in the last two years, the steel industry had barely moved into the black in the first quarter. There were hopes that prices and operating rates would rise to respectable levels in the final three quarters of the year.

The second quarter was pretty much in line with estimates. Shipments of about 20 million tons compared with 19.4 million in the first quarter. Mill officials expected some significant price relief at the start of the third quarter.

By June, however, it was clear the summer quarter was going to be a dud. The sheet market, which had been the one strong area, was hit by inventory cutting. The service centers were making particularly deep cuts.

In other markets, there just had never been a real recovery. Capital spending was supposed to increase by nearly 15 pct in 1984, but demand for plates and structurals was still lagging. Also lagging was demand for the merchant bars and medium sections that go into commercial and public construction. The mini-mills reported flat demand.

One cause of the stalled market was foreign trade. More than 8 million tons of steel were imported in the first four months of 1984. Domestic industry members looked for the foreign flow to slacken, but steel imports for the year likely will be at least 22 million tons.

That was 4 million tons more than domestic mills had predicted earlier. Accordingly, estimates of domestic shipments were being lowered by that amount, with the entire deduction to come in the second half.

It's possible the loss to imports will be greater than is now anticipated. President Reagan is due to act by Sept. 24 on the injury complaint of Bethlehem Steel Corp. and United Steelworkers of America. Mr. Reagan could impose quotas. That possibility gives foreign producers an incentive to maintain heavy shipments through the summer.

None of this really explains why the steel market has suddenly run out of gas. Steel users added about 4 million tons of inventory in the first half. That isn't very much for a recovery, particularly since more than 10 million tons of inventory were liquidated in 1982.

One problem is that the recovery started from a very low point. The recession of 1982 was the worst since the 1930s. The recovery from the recession has been fairly sluggish. Going into 1984, the net rise in real national output since the start of 1982 was only 1.5 pct. Despite the flashy growth figures of recent quarters, the economy is still in a semi-depressed state.

And growth rates notwithstanding, an economic slowdown may now be underway. The recovery has been powered by consumer markets. Both the housing and auto markets are being zapped by high interest rates.

Another factor is permanent shrinkage of the steel market. For a given level of the economy, the market is probably 10 million tons smaller than it was five years ago.

NONFERROUS

Signs that the business recovery was being nudged into a lower gear by concerns over interest rates and a measure of breath-catching brought a softer tone to nonferrous metals as the second quarter drew to a close.

Free market aluminum prices softened as inventories moved upward at the producer and hedge market levels. Copper prices remained in the doldrums for want of any speculative interest on the part of traders. The price of lead moved up largely on fears of supply stringencies in the months ahead because of current and possible labor problems at U.S. mines.

There still was plenty of good news on the economic front, with U.S. car production running about 30 pct ahead of last year and consumers still buying. The National Association of Purchasing Management reported that production and new business bookings were on the rise, albeit at a slower rate, and that purchasing managers were adding to inventories of production materials.

Incoming orders booked by the aluminum companies during most of the second quarter were down from unusually high first quarter levels, but the producers still project gains of from 9 to 11 pct for the year as a whole—to 7.2 million to 7.5 million tons. The industry got off to a flying start with a 26.3 pct jump in shipments in the first quarter. Deliveries in the second quarter are expected to be down, reflecting both the lower rate of incoming orders after mid-March and the need to leave room for the anticipated stronger showing in the second half.

The increase in deliveries was accompanied by an increase in producer stocks, however, and the resulting softness in free market ingot prices leaves the producers with less room for maneuver in the mill products market.

Forward aluminum on the London Metal Exchange slipped under 60¢ a lb again early in June. Some industry analysts still see the North American ingot price moving toward closing the gap with the 81¢ a lb published price later this year, largely on anticipation of an upturn in industry shipments in the second half and some catching-up in aluminum markets abroad.

The copper producers, who are having their own problems with government-controlled overseas production, aren't having much luck in the pricing department either. Shipments by U.S. producers are up from last year and so is domestic consumption. But imports are up as well and hedge market inventories haven't come down to levels that will draw speculative/trader interest.

There have been some faint signs of pickup in the capital goods sector—the missing ingredient in copper's pie—but the copper producers still have the slow July vacation period at the brass and wire mills to get through.

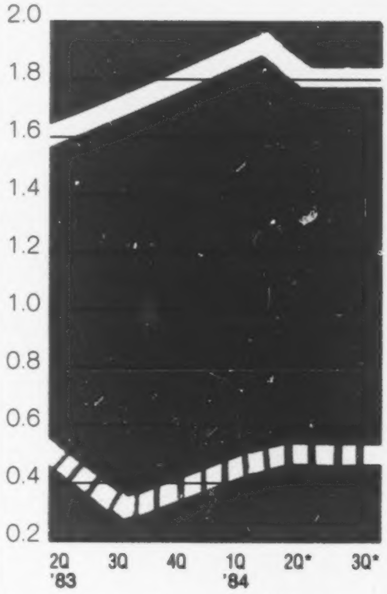
The International Trade Commission approved the U.S. copper producers' Section 201 petition on June 14 and is scheduled to provide President Reagan with its report on July 9, after which the President has 60 days to accept, reject or modify its recommendations. Imports of refined copper—and copper and brass mill products—were still rising through the first quarter of 1984.

The slow pace of capital goods markets continues to limit recovery for nickel and molybdenum. Zinc stocks at the producer level remain tight and shipments through the first third of 1984 were about on par with 1983 levels. Higher car production remains a mainstay, as does the zinc penny.

Lead shipments were running about 18 pct under the 1983 pace and producers' stocks moved up sharply in the first third of the year. Although demand for lead from the battery makers is seasonally slack, prices took on a firmer tone toward mid-June because of strike-caused production losses. The producers carried a two-month supply into May, based on average shipping for the first four months of the year.

. . . the (aluminum) producers still project gains of from 9 to 11 pct for the year as a whole.

Nonferrous Metals Shipments
Millions of Short Tons



Source: American Bureau of Metal Statistics, Aluminum Assn.
*IA estimate

▬ Aluminum
▪▪▪ Copper

AUTOMOTIVE

U.S. automakers likely will sell 2 million cars in the third quarter. That's 200,000 fewer than they sold in the second quarter of 1984 but 400,000 more than they sold in the third quarter of 1983. Car sales usually are higher in the second than in the third quarter.

The 2.2 million cars sold in the second quarter exceeded the expectations of most auto executives and analysts. Sales of domestic cars in the first half exceeded those in the first half of 1983 by about 800,000 units, up 24 pct.

The auto industry presently is working at nearly 100 pct capacity; many plants are running overtime.

Sales of some of the more popular models were constrained by capacity in the second quarter. "I also expect to see sales constrained by capacity in the third quarter," said one auto analyst.

"Sales in May," said the analyst for another automaker, "were the third best figure ever for that month. Cars sold at an annual rate of 8.6 million.

"But the U.S. auto industry can build only 8.1 or, if squeezed, 8.4 million cars in a year. We can't maintain the 8.6 million annual rate of May.

"In the third quarter, we can't build at an annual rate of much more than 8 or 8.2 million."

The United Autoworkers (UAW) began talks with GM and Ford in July to negotiate a new labor contract. The present contract expires Sept. 14.

The big profits and executive bonuses at the Big 2 likely will result in UAW demands for hefty wage increases. A strike is possible. GM would be the likely target, said one UAW vice president.

The booming sales and the possibility of a strike are two good reasons for the automakers to add production capacity. They lack the excess production capacity now to build up a supply that would cushion dealers against a strike-caused shortage of cars.

Dealers had 1.5 million cars, a 48-day supply, in the middle of June. That's the lowest dealer inventory in ten years. By the end of the third quarter, they should have a 57-day supply, still less than the normal 60-day supply.

The low inventories mean that dealers would quickly be hurt by a strike.

A strike at GM and/or Ford would severely curtail production at American Motors and, to a lesser degree, Chrysler. Both AMC and Chrysler buy many parts from the Big 2.

Still, the automakers are unlikely to add production capacity for two reasons, said one auto analyst:

—"We're near the peak of an economic cycle. It's four to six months away, or we've already hit it." Expecting sales to slow after the cycle peaks, automakers don't want to repeat the excessive capacity and massive layoffs of 1981-82.

—"The restrictions on Japanese imports," said the analyst, "probably will end in April 1985. Or the Japanese will be permitted a 10-pct increase in exports to the U.S. under the voluntary restraint agreement (V.R.A.). Either way, I expect a 10-pct increase in sales of Japanese cars here."

Interest rates continue to play a major role in consumers' decisions whether and when to buy a car. The high sales in the second quarter are partly due to consumers' expectations that interest rates will rise later this year.

Analysts at two automakers are forecasting that interest rates will rise by about 1½ pct during the second half.

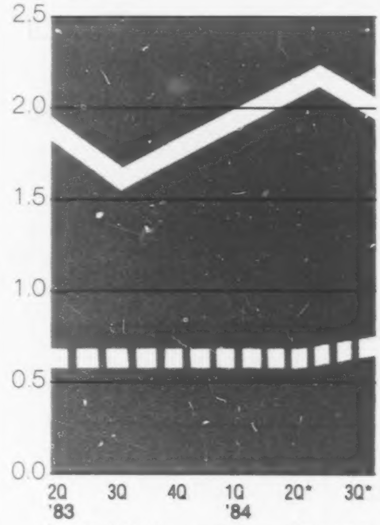
"An increase of 1 pct," said one analyst, "raises the average monthly car payment just $4. So interest rates shouldn't have that big an effect on car sales. But they do—because of the way they affect consumers' perceptions."

If rising interest rates hurt car sales, automakers probably will offer lower rates through their financial divisions.

Auto analysts expect car sales for all of 1984 to total about 8.1 million domestic and 2.6 million import units. The 8.1 million domestic sales would exceed last year's total by 1.3 million.

The auto industry presently is working at nearly 100 pct capacity; many plants are running overtime.

Automotive, Sales
Millions of Units



Source: MVMA
*IA estimate

MACHINE TOOLS; FLUID POWER

MACHINE TOOLS—If patience is really a virtue, then the machine tool industry is headed for canonization.

The nation's economic recession has been "officially" over for 1[illegible] months, but order books in the industry have yet to reflect official good news.

The order facts as presented by individual builders are only moderately up from the lows of the past three years.

"We can say business is better, even much better than it was compared to the worst couple years I can remember," says one industry executive.

Machine tool builders remember $5 billion years. This year is shaping up to be perhaps half that—and adjusted for inflation, less than half.

"Machine tools, in general, are what most companies call expensive purchases," explains another builder. "The leading edge of the industry, such as FMS equipment, is very expensive. We don't expect our major customers to make major machinery moves until they're completely convinced that sensibility will really rule for a long time in the U.S. when it comes to interest rates and the deficit."

Others in the industry note that even if fiscal and monetary policy in the U.S. became downright stingy, machine tool builders would still be up against foreign competition that can price American companies out of the market.

"Until there's some action on 232, I don't believe anyone in this industry will feel certain about anything," says one analyst.

The industry's petition remains waiting in Washington for the President's nod one way or another.

Some industry sources are predicting "half-a-loaf" with certain defense-oriented product lines being given relief and others none.

Meanwhile, machine tool builders are enjoying an increase in business even though at present rates of growth it will be a year or more before 1979 levels are reached.

FLUID POWER—The tremor that ran through a number of industrial markets in April hit fluid power equipment manufacturers as well. But even allowing for that downward wobble, this industry has seen a banner recovery in 1984.

Hydraulics had further to go in making its comeback than pneumatics, but turned in some astronomical gains over 1983 through the first quarter and much of the second quarter, data from the National Fluid Power Association (NFPA) survey of its members showed.

Hydraulics orders were 50 pct or more above the opening months of last year. Even April, when the downward hitch occurred, was almost 50 pct over the year ago period. Pneumatics, which did not drop as much in 1983 as hydraulics, scored a 60 pct gain in January (over the year-ago month) but the pace slowed the following month.

Averaged together, the two branches of fluid power have posted a gain of nearly 50 pct per month above the year ago period for the first five months of this year.

Reports from a recent NFPA meeting suggest a strong optimism. The April hesitation didn't hit everybody. And even those who did see things fall back a little in April are back on strong reports for May and June.

The summer decline is an annual event and despite the strength of 1984 to this point, most marketers expect it to take down sales in July and August. But they also are expecting a good recovery rate by September.

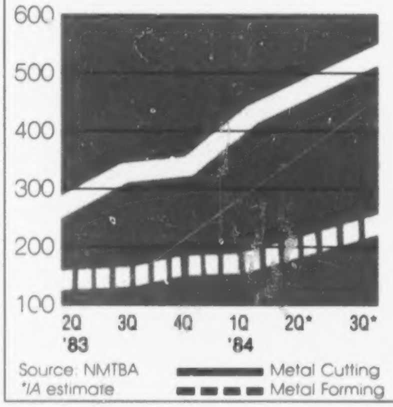
The pace is still hot enough, even as summer approaches, that a few price increases were again being tested out in the marketplace. Customer reaction was not warm, but the price gains seemed to be holding.

Earlier this year, some industry members predicted a better export business. The foreign market is better, but mainly for U.S. builders who can supply foreign markets from off-shore bases.

(Machine tool orders) are moderately up from the lows of the past three years.

Machine Tools, Net New Orders

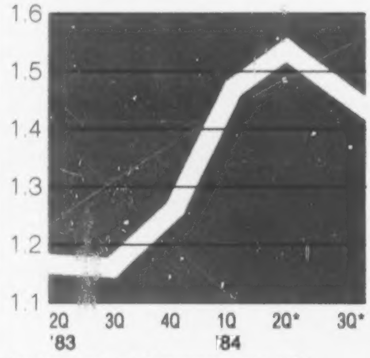
Millions of Dollars



Source: NMTBA
*IA estimate

Fluid Power, Shipments

Billions of Dollars



Source: Dept. of Commerce and NFPA
*IA estimate

INDUSTRIAL COATINGS; PLASTICS

COATINGS—After excellent sales in the first half of 1984, makers of industrial coatings expect a gradual downturn in sales during the second half. Shipments likely will drop from 98 million gallons in the second quarter to 90 million in the third.

"We may not be a bellwether industry," said the vice president of one major Indiana firm, "but we're a very good signal flag. And we expect a gradual winding down of consumer buying.

"Most metal markets will flatten out. Autos, homes, industrial and office buildings will be flat."

Shipments in the first half of 1984 were better than for several years. But April saw a big drop in sales. They recovered in May but fell again in June. June and July traditionally are slow months, though sales usually pick up in late August and September.

Some markets could continue to grow in the third quarter. Coil coaters, for example, expect sales for pre-engineered buildings to continue the upturn of the first half. Such sales in the first half of 1984 were up 10 pct over those in the first half of 1983, said a manager of a major Midwest firm.

Another vice president, however, expects sales of the coil coaters to drop in the third quarter.

At least one major coil coater is finding new markets with a new coating for pre-engineered buildings and a weldable primer for farm equipment. Coil coaters also are steadily increasing sales to appliance makers.

In the mobile-home market, Japanese steelmakers are winning market share from American aluminum firms with a new thin galvanized steel that's sold both coated and uncoated. Coil coaters are coating some of the Japanese steel.

The rise in raw-materials prices will continue to raise the price of coatings in the second half. The prices of titanium oxide and the nitrocellulose lacquer resin already have jumped by 10 pct.

PLASTICS—The plastics industry came off a banner year in 1983 with slightly more than 37 billion lbs in production and in sales and captive use.

The boom has continued into 1984. In the first quarter, for example, production moved up by 16.2 pct over the same period in 1983. In sales and captive use, plastics increased by 12.7 pct for the same period.

Business is still booming with a second quarter about 4.5 pct ahead of the first quarter. Industry sources expect the third quarter to remain about at the same level as the second quarter. Overall, the prediction of an annual improvement of from 6 to 8 pct still looks very feasible.

Among the types of plastics that are familiar to metalworking, the phenolics are moving especially well. Phenolics are used in coated and bonded abrasives, foundry and shell molding, and insulation materials.

Perhaps more familiar to metalworking are the reinforced plastics/composites. This industry is looking for a 2 billion lb year. The forecast is for record shipments of 2.155 billion lbs this year, an increase of 12 pct over the poundage estimate in 1983. The previous high was 2.046 billion lbs in 1979.

The prediction is that construction will move up 6 pct to 422 million lbs and electrical/electronics will increase by 11 pct to 189 million lbs. (Both of these industries registered previous highs of 335 million and 180 million lbs, respectively, in 1979.)

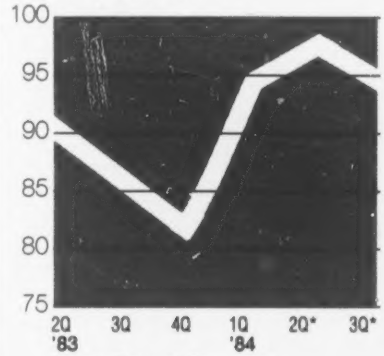
Corrosion-resistant applications for reinforced plastics will increase 11 pct to 320 million lbs and consumer products will move up 12 pct to 143 million lbs.

Other markets with very good growth forecasts include aircraft/aerospace/military, 29 million lbs (up 16 pct); appliances/business equipment (up 16 pct); marine, 309 million lbs (up 12 pct); and land transportation, 540 million lbs (up 18 pct).

Coil coaters expect sales for pre-engineered buildings to continue the upturn of the first half.

Industrial Coatings, Shipments

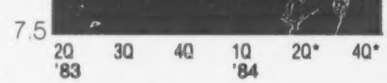
Millions of Gallons



Source: Dept. of Commerce
*IA estimate

Plastic Resins, Sales & Captive Use

Billions of Lbs

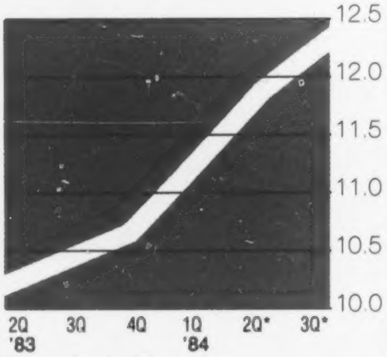


Source: SPI Committee on Resin Statistics, compiled by Ernst & Whinney
*IA estimate

COMPUTERS; INSTRUMENTS & CONTROLS

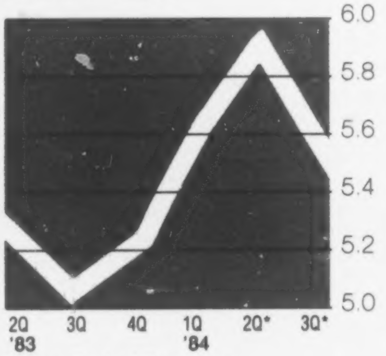
The export market for computers should grow even faster than home markets in the third quarter.

Computers, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Instruments & Controls, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

COMPUTERS—The computer industry continues to move in the fast lane. At midyear, shipments are running 16 pct above comparable 1983 figures, while new orders are 28 pct ahead of last year's pace.

Forecasters believe industry shipments for the year will be up 18 pct above 1983 totals, as third and fourth quarter orders subside slightly after a strong first half. The fear is that rising interest rates will dampen domestic sales in the final two quarters.

The export market for computers should grow even faster than home markets in the third quarter. As European countries shake off the lingering effects of recession, U.S. computer exports should increase more than 20 pct, with much of that increase coming in the second half of 1984.

Despite growing strength in exports, computer products coming into the U.S. are stronger still. For the year, imports are expected to increase by nearly 60 pct, resulting in the erosion of another $500 million in the U.S. computer industry trade balance. For the next several years imports should continue to make inroads into the U.S. market.

Entering the third quarter, several segments of the computer industry continue strong performances. Personal computers remain popular in the front office and are beginning to find their way into manufacturing-related operations. In addition, superminicomputers, used primarily in computer-aided design/computer-aided manufacturing (CAD/CAM), numerical computation, and communications activities, are selling well. CAD/CAM system sales, for example, based on a strong showing through the first six months, should register a year-end improvement of 30 pct over 1983 sales totals.

Semiconductor sales also will show a sales increase of 30 pct by year's end.

On the negative side, 1984 has seen a sharp decline in sales to the home computer market.

INSTRUMENTS & CONTROLS—Early predictions for no growth of the instruments and control industry in 1984 appear to be overly pessimistic. Based on midyear estimates, the industry is showing a healthy 14 pct rate of growth.

This spurt, however, is not expected to continue and should flatten out in the third and fourth quarters.

One reason that the industry has had a good first half is that capital spending has picked up modestly. Surveys are forecasting that business plans to spend $309 billion for new plant and equipment in 1984, 14 pct more than in 1983. Product shipments of instruments traditionally depend on spending for plants and equipment.

The industry has also depended heavily on exports. Because of the high cost of the American dollar and the slow economic recovery overseas, the export of instruments continues to flounder.

However, industry officials are predicting that exports will begin to pick up at the end of the third quarter and will grow stronger throughout the fourth quarter.

Besides increased exports, the third quarter will see an increase in imports. At present, the value of imports is approximately one-third the value of U.S. exports, but imports are eating away at this favorable balance of trade. In two major groups—analytical and test and measurement instruments—imports from Japan have increased more than 40 pct over the past year.

One segment of the industry continues to perform well—instruments that are used by the semiconductor, computer, and telecommunications industries. This should grow at 20 pct clip through the remainder of 1984.

Instruments aimed at the housing and automotive markets also have done well in 1984, although higher interest rates could dampen housing starts and car purchases in the third quarter, slowing instrument sales.

OIL COUNTRY; MINING EQUIPMENT

OIL COUNTRY—A relatively strong rebound in shipments of oil country tubular goods seems likely to continue into the third quarter of 1984 as inventory declines and oil drilling emerges from the usual seasonal downturn.

In the first half of this year, the most dramatic increases in oil country tubular goods (OCTG) shipments have been in the import end of the industry.

Industry officials contend lower-priced European imports have been flooding the market at the expense of domestic producers. The trend seems likely to continue into the new quarter.

Drillers and distributors have begun to replace stocks that dwindled at the tail end of the recession, helping to spur the industry.

The severe discounting that's affecting the industry is lessening, although the European surge is having an adverse impact on domestic producers.

One positive sign for the industry continues to be the domestic rig utilization rate.

The rig count dropped slowly between January and April—a usual seasonal occurrence—but has since reversed itself.

Now, drilling rig counts are running at an average of about 2,300 (compared to less than 2,000 one year ago at this time).

An increase in rig utilization should continue in the third quarter, and the average in 1984 should rise between 8 and 10 pct above the 1983 average of 2,230. That would clear up any remaining inventories of OCTG and set the stage for an even stronger recovery in 1985.

Pricing uncertainties here kept many industry officials from stockpiling OCTG inventories.

But a continued economic recovery, normal seasonal weather patterns and continued profits for major oil companies are all factors that should combine to produce a stronger third quarter for the industry as a whole.

MINING EQUIPMENT—Mining equipment manufacturers are in the doldrums and most don't expect any great news in the foreseeable future. Main reason: overcapacity in iron ore, copper and coal.

Many iron ore mines, over the past few years, have been either closed or reduced. No one expects any new iron mine projects of any significance to be announced for years. In fact, the great worry in iron ore is cheap ore from Latin American mines newly built. "If that stuff (high grade South American ore) starts pouring in for American steelmakers, then you can kiss a lot more of the iron ore industry up here (the upper Great Lakes) good-bye," says an industry source.

Suppliers to the iron ore industry in the North American market expect only replacement and maintenance business to sustain them for several years. Worldwide, however, business has been good, which is part of the problem, some sources say.

Coal mining equipment manufacturers, on the other hand, are reporting far better news for the second quarter. "Except for those states, like Ohio, with high sulphur problems, coal mining has been a busy industry compared to recent years," says an industry expert.

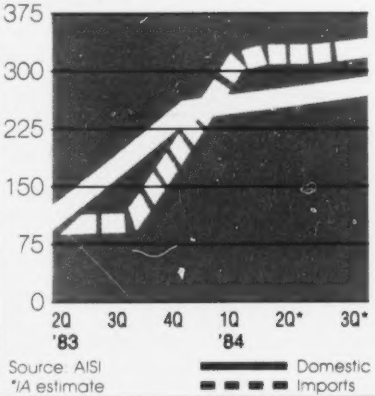
Coal equipment manufacturers, however, are not reporting any signs of a boom period. "The mines are in place. The capacity is adequate. With high coal usage our business is good because we supply replacement parts. I don't expect any orders for the really large equipment like power trains to be out this year or even next," says one company vice president.

Coal mining has been fighting two wars for years. One is financial. The other is political.

High interest rates have a serious effect on coal mining decisions about expansion. That uncertainty also affects decisions in the equipment end of the mining industry.

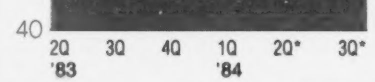
The most dramatic increases in OCTG shipments have been in the import end of the industry.

Tubular Goods, Shipments
Thousands of Net Tons



Source: AISI
*IA estimate

Mining Equipment, Sales
Millions of Dollars

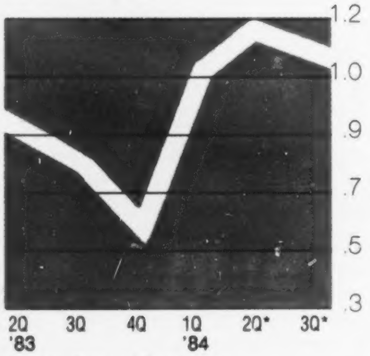


Total U.S. and export figures, based on present dollars, includes continuous miners, mobile loading machines, shuttle cars and cutting machines.
Source: Mining Equipment Manufacturers
*IA estimate

CONSTRUCTION; FARM EQUIPMENT

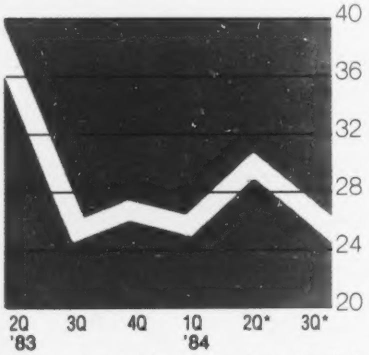
The highway equipment market segment was a leader in the 1983 recovery and is holding up quite well.

Construction Equipment, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Farm Equipment, Wheeled Tractor Sales
Thousands of Units



Source: Farm & Industrial Equipment Institute
*IA estimate

CONSTRUCTION—Construction machinery forecasts, after some tax recovery buying at the end of the fourth quarter, continue to show a better performance in 1984 than last year. Even though industry sources say they believe that the mild spurt at the end of the fourth quarter borrowed some sales from the first quarter, the first and second quarter have continued the gains that had been expected through all of this year.

Seasonally, the industry picks up about 20 pct over the first quarter in the second quarter of any calendar year and that recovery still appears to be on track. That means industry sales would tail off moderately in the third calendar quarter, as the forecast chart indicates. This isn't a steep drop—usually only about 7 pct. Industry forecasters say they can hold at that figure even if interest rates continue to rise.

The highway equipment market segment was a leader in the 1983 recovery and is holding up quite well. Some companies, particularly in the paving equipment area, say they can measure further gains this year despite a performance that was higher than many segments of their industry when the recovery began last Spring.

There's still disagreement as to how well inventories of finished goods have been cleaned out by the low industry manufacturing rates of 1983 and 1982. There's been enough of an inventory reduction, however, that the higher manufacturing rates reported in the first quarter have held up and will continue through the current quarter, tailing off during July and August.

The manufacturing rate is still low by historic standards, yet for many plants it's the best level they've hit in the past three years.

Export continues to be of only moderate help. The dollar is still too high relative to other currencies to give U.S. builders the kind of push they should get from what seems to be a mild recovery in foreign markets.

FARM EQUIPMENT—Farm machine forecasts have a tendency to parallel construction machinery. Many farm machine builders also have light construction machinery lines and some market equipment into both of these markets.

But where construction machinery is tracking along pretty well, farm equipment is showing a lot of disagreement.

A major industry member reported production up 15 pct from the year ago period and sales up by the same figure.

At the same time, another major equipment producer was beginning to cut back its schedules. It's causing a lot of confusion and has cooled some of the enthusiasm over tractor sales, which in the first four months of this year were up over 8 pct.

From a forecast 10 pct gain this year that was expected in January, a consensus reported by the Farm & Industrial Equipment Institute now puts 1984 sales up only 8 pct.

The other big ticket item, combines, hit their seasonal selling stride in June, but were saddled with about one-year's supply of machines.

What's surprised some people outside the industry was the gains in manufacturing schedules at a number of farm equipment plants. These weren't big, but they tracked upward fast enough to keep field inventories at a high level even as tractor sales advanced in the first quarter.

Farm equipment is still a buyers' market. Prices have been soft for over a year and probably were softer by the beginning of 1984. Farmers have finally begun to spend some of their PIK money from 1983 crop sales, and crop prices have been pretty good through the first part of 1984.

The stage should be set for a stronger farm machine year, but it's not producing any really solid manufacturing gains. Things are better, but not that much better. Nobody's getting exciting even though equipment sales are above last year's levels.

CASTINGS; FORGINGS

CASTINGS—Foundries continued to show good gains in the second quarter and will continue a strong performance for this quarter and probably the rest of 1984, say foundrymen.

Tonnages of castings shipped have been running more than 25 pct over the year ago period during the first half of 1984. Even allowing for a normal summer seasonal drop, the tonnages against a year ago will continue to look good in the third quarter.

Even with this recovery, the domestic foundry industry has a long way to come back. In its peak year, 1978, the industry shipped 19 million tons of ferrous castings. At the lowpoint in 1982, it shipped 8.5 million tons. This year, the industry expects to ship about 10 million tons, though the first half has been running at a stronger rate.

It means that some foundries, particularly specialists who supply the auto industry, are running at high rates. But a lot of plants that make big castings are around 60 pct of capacity and some are still struggling along at figures as low as 40 pct of capacity. There's enough demand to call for a higher operating rate, but they've been hit hard by imports from the Far East, India, Canada and Mexico.

This has also made for some difficult pricing situations. The new foundries have a lot more efficient equipment, so they can operate at a much lower break-even point. But it is still difficult to keep net returns up.

Gray iron is running well, helped by the continuing high strength of auto and appliance demand. What's adding to the new volume, and particularly to the heavy castings demand is the gain in capital goods markets. Trucks, diesels, and even some railway orders are helping, besides the continuing gains in machine tools and other manufacturing machinery. The soft spots are still farm equipment—always an important castings market—and some parts of the construction machinery market.

FORGINGS—The forging industry continues its steady climb out of the recession.

Bookings of impression die forgings in the second quarter were running more than 50 pct ahead of a year ago period. Orders should continue to improve at a 50 pct clip, in comparison with 1983 figures, through the third quarter.

The large increase in orders the forging industry is experiencing this year is not so much an indication of health but of the long way the industry has had to climb to pull itself out of the past recession. For example, bookings of forging orders during 1982 were 45 pct below 1981 totals.

Even today, the industry has yet to recover its former strength. Sales of forgings to the truck and automotive industry remain strong.

Some 20 pct of industry shipments go to automobile, truck, bus and motorcycle markets. By comparison, only 13.6 pct of the industry's shipments went to these industries in 1982. Ordnance sales also have picked up in recent months.

Forgings also are increasing their penetration in housing-related markets (plumbing fixtures, valves and appliances, for example) and in fabricated plate work and special machinery.

Major markets are still in the doldrums. The aerospace industry continues to flounder. There are few signs of increased agricultural equipment purchases. Sales to oilfield and off-highway equipment makers remain sluggish.

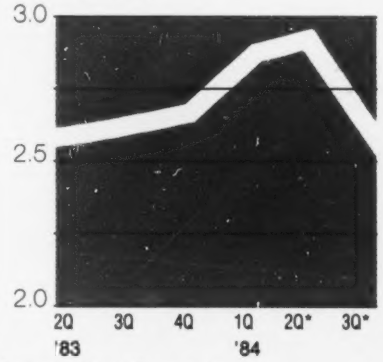
Industry officials, however, are confident that forging sales to the automotive industry will continue to hold up through the third quarter and that off-highway equipment and the oilfield market, which gave indications of growth in the second quarter, will pick up this quarter.

There is also some industry optimism that more orders soon will be arriving from the aerospace industry.

Tonnages of castings shipped have been running more than 25 pct over the year ago period....

Ferrous Castings, Shipments

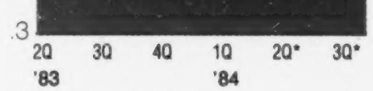
Millions of Tons



Source: Dept. of Commerce, Iron Castings Society
*IA estimate

Impression Die Forgings, Shipments

Billions of Dollars



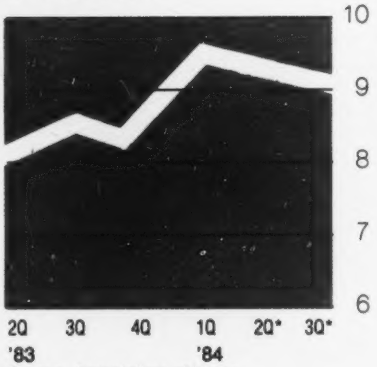
Source: Forging Industry Assn.
*IA estimate

APPLIANCES; MATERIAL HANDLING

Buoyant consumer spending and a hot spring . . . have kept appliance sales brisk.

Appliances, Shipments

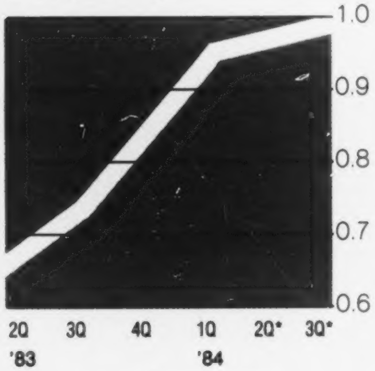
Millions of Units



Source: Association of Home Appliance Manufacturers
*IA estimate

Materials Handling, Shipments

Billions of Dollars



Source: Material Handling Institute
*IA estimate

APPLIANCES—Appliance sales, which came charging into 1984 like gangbusters, should remain strong through the third quarter.

Through the first quarter of this year, major appliance sales were more than 36 pct above the same period of 1983, and 1983 was a strong year for the industry. Through the second quarter, the figure slid to a 26 pct increase. Even by the end of the third quarter, 1984 sales should be about 17 pct greater than comparable 1983 totals.

Buoyant consumer spending and a hot spring, which caused air conditioning sales to skyrocket, have kept appliance sales brisk. However, in the third and especially the fourth quarter, a major force will be conspiring to slow down booming appliance sales.

Rising interest rates are already bringing on a decline in housing starts. When mortgages top 14 pct, which they have recently done, housing sales and starts tend to tail off dramatically. High interest rates also mean that the customer who buys appliances on credit is less likely to borrow the money.

On the positive side, appliances are not as credit-sensitive at automobiles and will continue to sell when other industries feel the restraining tug of high interest rates. In addition, because a large percentage of home appliances are old—over ten years old—a demand for new appliances continues.

Finally, as the overall economy continues to improve, more people are finding jobs and, consequently, have more to spend on a new appliance.

Despite rising interest rates, the appliance industry should hold up well enough in the third and fourth quarters to make 1984 the second best year (and possibly even the best year) for the sales of major home appliances.

The appliances experiencing the greatest rates of growth in 1984 are microwave ovens and room air conditioners, with increases through April of 85 pct and 78 pct respectively.

MATERIAL HANDLING—Material handling equipment manufacturers report steady increases in bookings as the recovery continues. While the deficit and interest rates have some companies worried about an aborted recovery, most are quite optimistic about the second half of 1984.

"We are worried, somewhat, about erratic, if not high interest rates," says one large systems maker. "And we do feel concern, like I suppose everyone does, about deficit spending. Our product is very costly and perceptions about interest rates are a major factor in purchases. However, we see no signs so far that the recovery is being slowed by those two factors."

But other segments of the material handling industry are not so optimistic. Large systems manufacturers have one special luxury not afforded to other industries or various other parts of their own. Imported product is a minor threat to companies here that make AS/RS equipment. "Our product is largely custom and foreign sourcing is usually not sensible for obvious reasons," says one industry executive.

Industrial truck makers, on the other hand, are not so optimistic about 1984's second half. Imports, particularly from Japan and other Asian countries, have captured a frightening share of the U.S. market and industry sources believe the American factory truckmakers may be repeating the tragic history of the "standards" people in the fastener industry while AS/RS companies are the "specials" manufacturers in material handling.

Still, most of the remaining industrial truck companies in the U.S. say business is better now than it has been in three years and the rest of 1984 should see continued improvement.

"If the economy continues to grow at the rate it has been for the first two quarters, we expect our industry to be in very good shape by the end of the year," says one truck maker.

WELDING; HEAT TREATING

WELDING—Like most industries, welding has been fighting its way back from some bad times.

For a while, the success of the battle looked too good to be true. The first quarter of this year was strong, and the second quarter was even stronger. However, business is showing signs of leveling off as the third quarter begins.

According to one executive, several of the big user industries of welding have come back, but they are certainly not the giants of former years (like 1981). The large companies have not come back strongly, either.

One bright sign is growing interest in robotic arc welding. Though only a tiny portion of the overall welding industry, sales are starting up. Not too long ago, many of the robot manufacturers could not understand why the welding fabricators would not invest in robots.

According to the National Welding Supply Association, Philadelphia, the month of January was the best month on record since the NWSA began keeping statistics in January 1980. Sales were strongest in equipment and filler metals. Shielding gases also demonstrated improvement.

Commenting on the good start in 1984, a spokesman for one of the welding manufacturers, said: "We would like to feel that it's going to stay that way for a period of time, but we're not quite that optimistic."

Defense business, mainly in the form of Naval shipbuilding, is strong. Construction is another industry making a good comeback for welding. And of course, automotive is in good shape. There's a lot of talk about some new pipelines, but it will be no surprise if none is started this year. In the pressure vessel field, not much business is available. What is out there seems to be going overseas.

The third quarter will not match the second quarter, but it might keep pace with the first quarter, which wasn't all that bad.

HEAT TREATING—Earlier *Iron Age* forecasts for heat treating performance in 1984 could be too low. Some heat treat plants have doubled their performance over 1983 in the opening months of 1984. A 50 pct gain is not uncommon.

It's one of the most remarkable performances in the industrial group, and though the rate of gain dropped back in the second quarter, heat treaters are showing a better recovery than many supplier industries.

This has been indicated by gains in heat treat equipment sales as well. But the new capacity tends to lag an upturn so that a quick sampling of heat treat shops finds a number of them up at capacity. There's been a continuing good business is supplying heat treated parts for the auto industry, but the amount of capital goods industry work has been growing.

Even in areas like oil country goods, say heat treat company officers, there have been steady gains in the first quarter. That has pushed some multi-plant heat treat companies to near capacity operations. Said one of them, "We're way over our best forecast, and we're revising our forecast for all of this year as a result."

There should be a seasonal slowdown in the July-August period and some sources report that these cutbacks were already appearing in the order-books by mid-June. That will help to hold back the second quarter output more nearly at the first quarter level but there will still be gains.

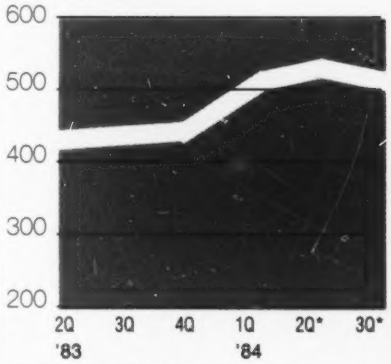
After the summer seasonal drop, marketers say, there's every indication that heat treat demand as well as demand for new heat treat equipment, will continue up to levels well over the 1983 average.

Since most heat treat companies were already doing much better in second half 1983, the gains can't be as much, percentage-wise, as they were in the surprisingly good recovery of the first quarter of 1984.

One bright sign is growing interest in robotic arc welding.

Welding, Shipments

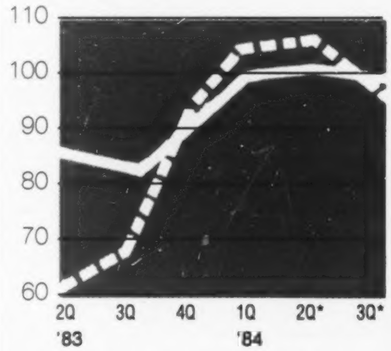
Index: 100 = $200 million in distributor sales



Source: National Welding Supply Assn
*IA estimate

Heat Treatment

Millions of Dollars



Source: Industrial Heating Equipment Assn., Metal Treating Institute
*IA estimate

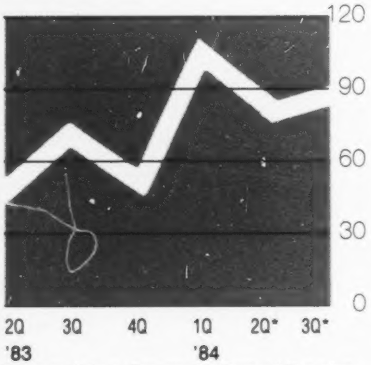
▬ Sales of Commercial Heat Treaters
■ ■ ■ Heat Processing Equipment Orders

AIRCRAFT; ENGINES & TURBINES

One major factor affecting the industry has been rebounding airline profits.

Commercial Airplane, Orders

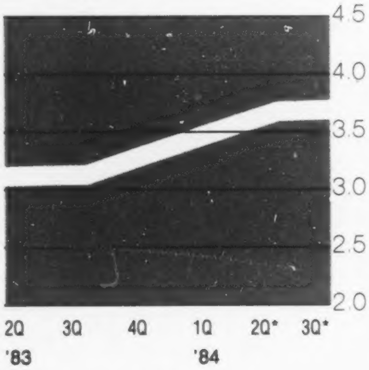
No. of Planes



Source: Airbus, Boeing, McDonnell-Douglas
*IA estimate

Engines and Turbines, Shipments

Billions of Dollars



Source: Dept. of Commerce
*IA estimate

AIRCRAFT—Increasing airline traffic and the strong U.S. economic recovery are combining to spell positive news for major airframe manufacturers. Major companies foresee 1984 sales of new aircraft to be at least the same level as one year ago, an indication that the lengthy slump that has sapped profits in the commercial aircraft sector has at last come to an end.

The first half of 1984 has been a lively one, with indications that this trend will continue well into the third quarter.

One major factor affecting the industry has been rebounding airline profits. At the beginning of the third quarter in 1983, the nation's major airlines were drowning in red ink, the bankruptcy of one company loomed and there were predictions of a major shake-out in the industry, all of which suppressed demand for new aircraft.

In 1984 the picture has radically changed. Air industry earnings could approach $1 billion by the end of the year, a far cry from the $730 million loss suffered in 1982.

The strength of the recovery is global; the International Air Transport Association recently reported world airline companies will climb out of the red this year for the first time in five years. Overall profits could reach $250 million.

For U.S. aircraft manufacturers this trend translates into fleet modernization and new orders.

Despite the general optimism, some dark clouds remain. The market for commercial aircraft remains extremely competitive with excess capacity continuing to exist in some areas, like widebody jetliners.

These conditions have led to substantial price pressure, the requirement of trade-ins of older airplanes when new craft are purchased, delivery slides, financing commitments and, often, the substitution of smaller jet transports for larger ones previously ordered.

ENGINES & TURBINES—Shipments in this industry have been slowly improving for the last few quarters. That trend shows little indication of changing through the remainder of this year.

The general economic recovery has helped the market rebound from its precipitous drop in early 1983.

But few industry officials are predicting any dramatic improvement in engine and turbine shipments in the short term, certainly not in the third quarter.

The utility segment of the industry continues to be plagued by lagging profits and an uncertain short-term economic future. Increases in consumer and industry demand for energy have not been as dramatic as originally projected; as a result there have been few new orders in the power plant market. The well-publicized difficulties with nuclear power also have adversely affected the market.

The strength of the domestic economic recovery has given officials in this wide-ranging industry reason for optimism.

But dramatic improvement that would translate into new engine and turbine shipments probably would not be felt until 1985 at the earliest.

Fears of a recession in the fourth quarter of 1984 or first quarter of 1985 could abort a strong recovery in the industry before it has had a chance to gain steam.

So, many industry officials are being cautious in their predictions, especially in the short-term.

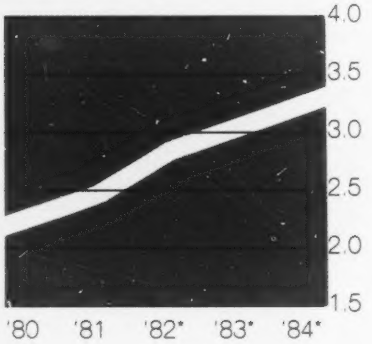
The backlog of earlier industry orders also is disappearing, a further sign of optimism.

The consensus among officials in the engine and turbine industry is that slow improvement will continue through at least the next quarter while the full impact of the general economic recovery continues to trickle down into the market for such long-range products as power plants and diesel engines.

SCREW MACHINE PRODUCTS; FASTENERS

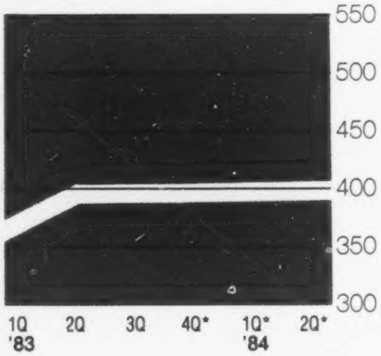
A slow auto market will have an impact on screw machine product sales.

Screw Machine Products, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Fasteners, Sales
Millions of Dollars



Source: Industrial Fasteners Institute
*IA estimate

SCREW MACHINE PRODUCTS—How the screw machine products industry will fare in the third and fourth quarter has suddenly become a mystery. Upbeat through the second half of 1983 and coming on strong through the first quarter of 1984, the industry suddenly suddenly saw a big dip in shipments in April. Before the April decline, shipments of screw machine products were up nearly 24 pct in comparison with the first four months of 1983.

The big question is: Were April declines an anomaly or the first indication of a softening market? There are mixed feelings among industry members, but most feel the industry is headed for a bit of a slowdown in the third and fourth quarter. Some fear that rising interest rates will slow their business as well as the economy in general.

The automotive industry, which was exceptionally active in the first half of 1984, will cool down in the third quarter. Since one-third of all screw machine products go to the automakers, a slow auto market will have an impact on screw machine product sales.

Many other industries which use substantial numbers of screw machine products are also predicting a flat second half. Spending for capital equipment—special machinery, machine tools, and the like—has improved modestly in the first and second quarters but is expected to fall off in the second half of 1984. Faced with the prospect of higher interest rates, manufacturers are revising downward their estimates on capital spending for 1984.

Despite earlier expectations, little evidence exists that construction or farm equipment sales will improve in the third quarter. Also, another significant market for screw machine products, the aircraft industry, remains flat.

On the plus side, the appliance industry has shown exceptional staying power and should continue to do well. In addition, electronics-related industries remain healthy.

FASTENERS—Mechanical fastener manufacturers have only recently noted a slight decline in their continuing climb up from the disastrous past three years.

"Business, in general, has been good for our first half. We're finding continuing increases almost across the board," says one industry spokesman.

Do rising interest rates and the Federal deficit worry the industry? "Naturally, we don't like either, but the effects of those two factors are upon our customers in a direct way. After all, this isn't even a nickel-and-dime business," says a company president.

What worries this industry more are imports and "alternative joining systems."

Imports have practically ruined some segments of the domestic industry and there is little hope among domestic producers that much of the "standards" business can ever be won back. "Specials" producers, however, are optimistic about 1984 and 1985.

Alternative joining systems—mainly welding and adhesives—are the industry's other perennial worry. While nobody's really gluing cars together and welding hasn't totally replaced rivets, there is a constant tug-of-war among the three major joining industries. "I could care less about the deficit or interest rates," says one specials maker, "Those are either matters of more or less inflation. I can live with inflation, at least some. But imports and things like adhesives keep me worried."

Others in the industry describe the rest of 1984 as "hopeful" and "better." The mood, while hardly ecstatic about prospects, is closer to optimism than it has been in three years.

Some of this optimism comes from the general belief that the economy is really entering a period of long-term steady growth. Some of it also comes from some serious moves on Capitol Hill to slap new controls on foreign products of many kinds, including fasteners, industry analysts say.

BEARINGS; STAMPINGS

BEARINGS—Bearing sales, buoyed by a heavier demand from the automotive industry, are expected to rise by nearly 9 pct in 1984. However, sales should tail off in the third and fourth quarter from a strong early showing.

Some major users of bearings—in particular, the automobile industry—are forecasting a slowdown in the third quarter. Auto output will dip as production catches up to demand. Automotive manufacturers are concerned that higher interest rates in the third and fourth quarter will curtail their sales.

Besides the industry-wide slowdown in the third quarter, the bearings industry has another major concern—imports. While bearing imports were off last year, they have come on this year with a vengeance.

In the first quarter alone, ball bearing imports were up 39 pct over 1983 first quarter totals, and roller bearing imports were up some 49 pct. Much of this bearing flood comes from Japan.

Speculation is that a sizable portion of these imports are destined for the automotive aftermarket that services Japanese cars. With the big influx of Japanese automobiles into the U.S. in recent years, a large aftermarket is springing up to service these cars.

The third quarter of 1984 will be a soft one for many major bearing users. The aircraft industry remains in the doldrums. Sales of machine tools and other machinery are expected to slip as businesses, concerned about rising interest rates, revise their capital equipment spending plans.

The farm and off-highway equipment industries have not recovered as expected this year and likely will remain sluggish in the third quarter. After a solid start this year, housing starts are not holding up. Therefore, less construction equipment will be needed.

Hope is that the slowing of business in the third quarter is just the economy taking a breather before it again moves forward.

STAMPINGS—Neither creeping interest rates nor their insidious effect on consumer spending plans seem enough to darken the stamping industry's overall expectations for the third-quarter.

"We anticipate gains to drop off a bit as the year progresses," said one Eastern stamping executive, who noted that the general rebound had to come down from its earlier high.

Still, the consensus among stampers is that their third quarter will outrank the second.

This confidence was reinforced by the April report from the American Metal Stamping Association. March contract metal stamping order bookings were at the highest ever recorded, while shipments shot up 21 pct from February.

And, although the industry's order backlog slipped a notch in March from February, it stood 29 pct higher than March 1983.

Another positive indicator: Industry employment rose 4 pct in March and was 11 pct higher than a year ago.

Stampers are banking on a continued binge in new car sales to keep their order books fat.

Other active markets include computer and office equipment, appliances and defense.

Yet there is some nail-biting over the housing situation. If mortgage rates catapult to between 16 and 17 pct, housing construction would slump and dragging with it sales of appliances and other housing-related items.

However, despite creeping interest rates, independent appliance sales should remain robust, punched up by a significant amount of consumer replacement and discretionary buying.

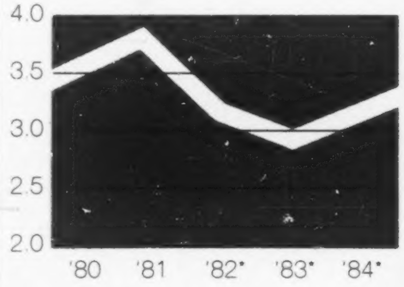
Recent sales activity has encouraged stampers to rebuild their inventories, although, as one put it, "very cautiously."

Lead times have stretched out a bit since the first quarter, but no further lengthening is anticipated.

The third quarter of 1984 will be a soft one for many major bearing users.

Ball and Roller Bearings Shipments

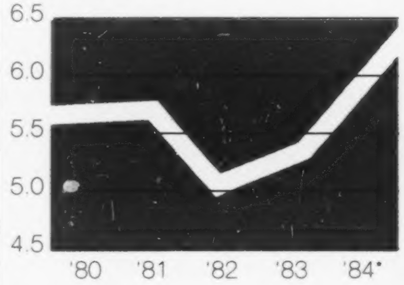
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Stampings, Shipments

Millions of Dollars



Based on the average of a control group whose shipments total more than $500 million annually
Source: American Metal Stamping Assn.
*IA estimate

GEARS; VALVES

GEARS—The gear industry sees the third quarter sales finishing 10 pct ahead of the second quarter.

After 1983's anemia, the gear industry was poised for a turnaround in 1984. The first quarter picked up as predicted, which made industry forecasters optimistic the second quarter would finish perhaps 15 pct ahead of the first.

Apparently, as one gearmaker told *Iron Age*, "this seems to be materializing."

But, despite the good news, gearmakers seemed noticeably guarded in their comments. The question mark, of course, is what will interest rates do.

"We've been stung before," one industry member said. "I guess we'd rather not sound too optimistic and wind up with egg on our faces."

Meanwhile, orders flattened in the last month, particularly among large gears (helical, planetary, worm or spur), which are more sensitive to rising interest rates.

Also flat these days are inventory levels. Lead times are still relatively short.

Growth in the automotive, appliance, aircraft and paper industries is expected to put teeth into gear demand and counteract the sluggishness that many industry members anticipate in their steel and petroleum markets.

The farm equipment industry remains mired in a slump, unaffected by consumer outlays.

A slight machinery sales pickup is expected through this year, but not enough to raise the hopes of the gearmakers and other suppliers.

Meanwhile, imports continue to harass domestic gear manufacturers who are certain there's little relief in sight.

Still, approaching the third quarter, gear manufacturers are pleased the economic revitalization has gotten them off the launch pad.

They just hope interest rates don't abort their flight.

VALVES—"I won't go so far as to characterize 1984 as rosy," said one valve industry spokesman, "but we are certainly coming out of the woods."

Indeed, the industry may emerge farther than expected.

One valve manufacturer predicted that this year will close not 4 to 8 pct ahead of 1983, but perhaps as much as 8 to 10 pct ahead.

He explained that his company is approaching the third quarter well ahead of plan and cited market strength in the small OEMs.

He said his sales in the past 8 to 10 months have been especially vigorous and he even cites some rise in demand for machine tools. This, in turn, translates into an increase in demand for servos and valves that go into them.

On a negative note, another industry source mentioned a softening recently in his sales to both truck and commercial vehicle markets.

Shipments of valves and pipefittings were expected to increase about 6 pct in constant dollars, lower than the projected 8.5 pct increase in fabricated metal products, but higher than the 5.2 pct rise forecast for GNP this year.

Oil field equipment, chemical processing plants, water and sewage treatment facilities, paper and paperboard and power generation plants are expected to be the chief contributors to this year's expanded valve business.

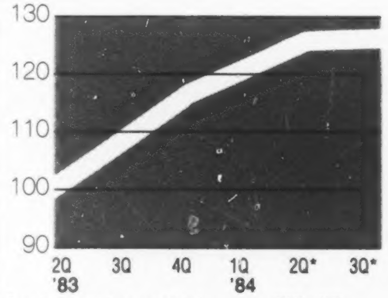
But an industry forecast indicated the continuing decline in commercial construction plus the slow upturn in petroleum refining will retard additional growth of valve sales through the second half of this year.

Meanwhile, reconditioning and repair work continue to increase as a percentage of the valve business.

What *does* plague the industry now is imports. After a sharp dip last year, imports are expected to rise about 12 pct this year to over $670 million, capturing an estimated 8 pct share of total U.S. apparent consumption.

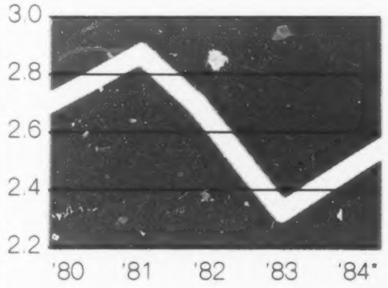
After 1983's anemia, the gear industry was poised for a turnaround in 1984.

Gears, Bookings



Based on average monthly bookings, 1977=100
Source: American Gear Manufacturers Assn.
*IA estimate

Valves, Shipments
Billions of Dollars

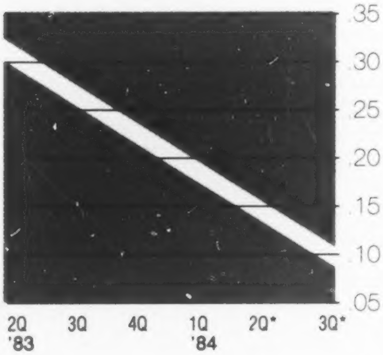


Source: Valve Manufacturers Assn.
*IA estimate

SHIPBUILDING, RAILCARS

Only four commercial ships of 1,000 ton gross weight or more are under construction in U.S. shipyards.

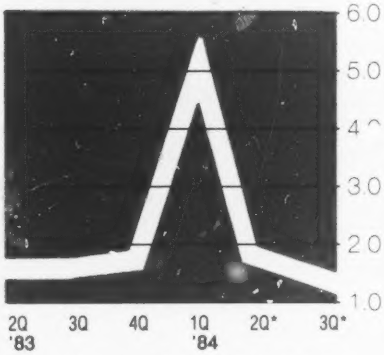
Shipbuilding
Millions of Gross Tons



Commercial ships on order or under construction, 1,000 gross tons or over

Source: Maritime Administration
*IA estimate

Rail Car Orders
Thousands of Units



Source: American Railway Car Institute
*IA estimate

SHIPBUILDING—Commercial shipbuilding in the United States continues its downward spiral. The first quarter was bad. The second quarter was worse. And, the third quarter seems destined to continue downward. Only four commercial ships of 1,000 ton gross weight or more are under construction in U.S. shipyards. By the end of the year, there might not be any.

Looking at it from another point of view, U.S. companies are very good customers for foreign-built ships, especially those constructed in Japan and in South Korea.

Last heard, the United States dropped to seventeenth place among commercial shipbuilding nations. We are now behind Romania and are barely ahead of India as a commercial shipbuilding nation.

Just when it looked as though Navy shipbuilding would be our salvation, the House Armed Service Committee sliced $1.2 billion dollars from the $13.1 Navy budget.

According to the Shipbuilders Council of America, Washington, D.C., in terms of numbers of ships, the Committee killed three vessels. They were a TAGOS ocean surveillance ship, a TAK support vessel and a FFG-7 guided missile frigate approved last year.

At the same time, the panel approved the funding of the DDG-51, the Arleigh Burke class guided missile destroyer, a new combatant "critically sought" by the Navy.

Despite the setback, the long-range goal of a 600-ship fleet for the Navy is still in sight.

The present glut among offshore structures continues to plague the shipyards that have been in that business in the past. New business is expected eventually, but certainly not soon enough to warm up any predictions for the third quarter of 1984. The good old days when American yards would be building 70 rigs at one time are gone. They are now down to two or three.

RAILCARS—After an extensive nosedive from 40,000 railcars in 1980 to 6,000 units in 1983, the railcar industry has bottomed out and is now on the way back. In early April, railcar production exceeded the grand total of orders during 1983. January, with orders for 2,736 cars, was the big month.

The second quarter of 1984 slipped back considerably and is more in line with the fourth quarter of 1983. The third quarter is not expected to do as well as the second quarter, although business is expected to pick up toward the end of the year.

According to the American Railway Car Institute, 722 new freight cars were placed in service in April, compared with 894 the month before and 205 during April 1983. Deliveries in the first four months of the year totalled 2,372 compared with 1,590 for the same period last year.

Cumulative orders for the first four months of 1984 totaled 6,144, compared with 1,622 railcars for the same period a year ago.

The backlog of cars on order and undelivered as of May 1 was 6,742 compared with 6,928 on April 1 and 4,326 on May 1, 1983. The average backlog for the year so far is 6,466 compared with 4,174 last year. Through the first four months, 115 locomotives were placed in service, compared with 20 a year ago.

Statistics are also available from the Association of American Railroads (AAR) on car loadings.

As of the week ending May 19, 1984, total cars loaded were 410,693. During a similar period the previous year, a total of 364,012 cars were loaded. Coal is still the major commodity for the railroads, although motor vehicles and equipment posted a strong gain this year. ☐

Reprints available while supply lasts. For single copy, circle No. 72 on Inquiry Card. Additional copies, $1 for articles up to eight pages. Longer articles $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write: IRON AGE, Reader Service, Chilton Way, Radnor, PA 19089. Ask for Reprint No. 1041

Capital Expenditures For Air & Water Quality Control

(In Millions of Dollars)

Year	Water	Air	Capital Expenditures
1983	$ 55.6	$ 84.6	$140.2
1982	104.8	[illegible]	261.9
1981	[illegible]	[illegible]	489.2
1980	[illegible]	[illegible]	510.5
1979	[illegible]	[illegible]	650.8
1978	[illegible]	[illegible]	458.0
1977	[illegible]	[illegible]	534.8
1976	[illegible]	[illegible]	489.2
1975	[illegible]	[illegible]	453.1
1974	[illegible]	[illegible]	267.2

Source: AISI

Expenditures for capital equipment have fallen dramatically in the steel industry as evidenced by these figures. (Photo shown is the electrostatic precipitators at the No. 4 A.C. station at Inland Steel.)

STEEL LICKS THE POLLUTION PROBLEM... FOR NOW

Although steel may be out of the woods and over the hump, there still exists some loose ends to tidy up. One loose end some producers are having difficulty with is the proposed standard for particulates.

BY GEORGE MCMANUS

"In terms of the existing state implementation plans, we've reached agreement with all of the states," said David M. Anderson, director of environmental and government programs for Bethlehem Steel Corp.

Dr. Anderson was referring to agreement on air cleanliness. With the possible exception of a legal contest at Burns Harbor, Bethlehem is up to snuff at all locations.

The company is, likewise, in good shape on water purity. "We're finishing up all of our permit negotiations," said Dr. Anderson. "They're practically done."

This would suggest the steel industry is over the hump and out of the woods on air and water quality. Dr. Anderson isn't so sure about that.

"We don't know," he said. "We don't know what's going to happen in the Eighties. It depends, I think, on the environmental movement. Anything we can see indicates there's not going to be any relaxation in any of these laws."

There is always the potential for a massive tightening. One legislative proposal called for pig iron and coke to be taxed as feedstocks under the Superfund program. Had the proposal not been killed, the cost to the steel industry would have been $150 million.

Steel producers are now battling the proposed standards for particulates. According to one estimate, the new secondary standard will cost all industry $14 billion with the steel industry accounting for 20 to 25 pct of this.

All of which explains why Dr. Anderson hesitates to pronounce an end to the era of heavy environmental spending. There can always be big new requirements.

"We think we are adequately addressing the present laws," said P.X. Masciantonio, vice president, environment and energy, United States Steel Corp. New laws could mean new problems, he indicated.

According to the American Iron & Steel Institute (AISI), the mills have spent $5.8 billion on clean-up devices since 1951. "The industry has equipment in place capable of removing 96 pct of criteria airborne particulates and 98 pct of water pollutants," said AISI.

In 1983, steel companies spent $140 million on pollution control. That was down from the peak of $650 million in 1979. It was the lowest outlay in over 10 years.

The environmental control department at Bethlehem's Sparrows Point plant check a scrubber operation with a portable sampling train.

For all industry, environmental spending has been trending downward. In real terms, spending has fallen in every year but one since 1975. There will be an upturn in 1984, with outlays of $7.6 billion comparing with $7.2 billion in 1983.

Less Controversy

All these numbers reflect the advanced stage of pollution control throughout industry. One interesting point is that there seems to be much less controversy. The deadline for applying the Best Available Technology to water systems was July 1, 1984. In the past, there would probably have been loud hassles prior to the deadline. This time, agreements on water technology have been reached with little fuss.

"We're going to be fully permitted," said Mr. Masciantonio. It wasn't too long ago that U.S. Steel was prominently featured on the Bad Actor list of the Environmental Protection Agency (EPA). Now, U.S. Steel seems to be in line for a good citizen award.

Not too many companies will actually meet the water deadline. Guidelines for water weren't finalized until February of 1983. That didn't leave nearly enough time to go through the long permit procedure and have the equipment in place by the middle of 1984.

Accordingly, there has been a de facto extension of the deadline. Permits are issued if companies can show they will have the required equipment installed by a specified date.

A similar course was followed on clean air. The deadline for compliance was the end of 1982. Because of lags in state implementation plans, a lot of areas and companies failed to comply with standards by that time.

There was talk at the time that EPA would ban new construction in non-attainment areas. The Clean Air Act called for drastic action of this nature. There was no construction ban. The deadline was simply ignored.

The government's approach on both air and water has been to leave obsolete legislation standing, but ignore the unrealistic provisions. That's fine, but it can mean companies are in technical violation of the law and vulnerable to citizen's suits.

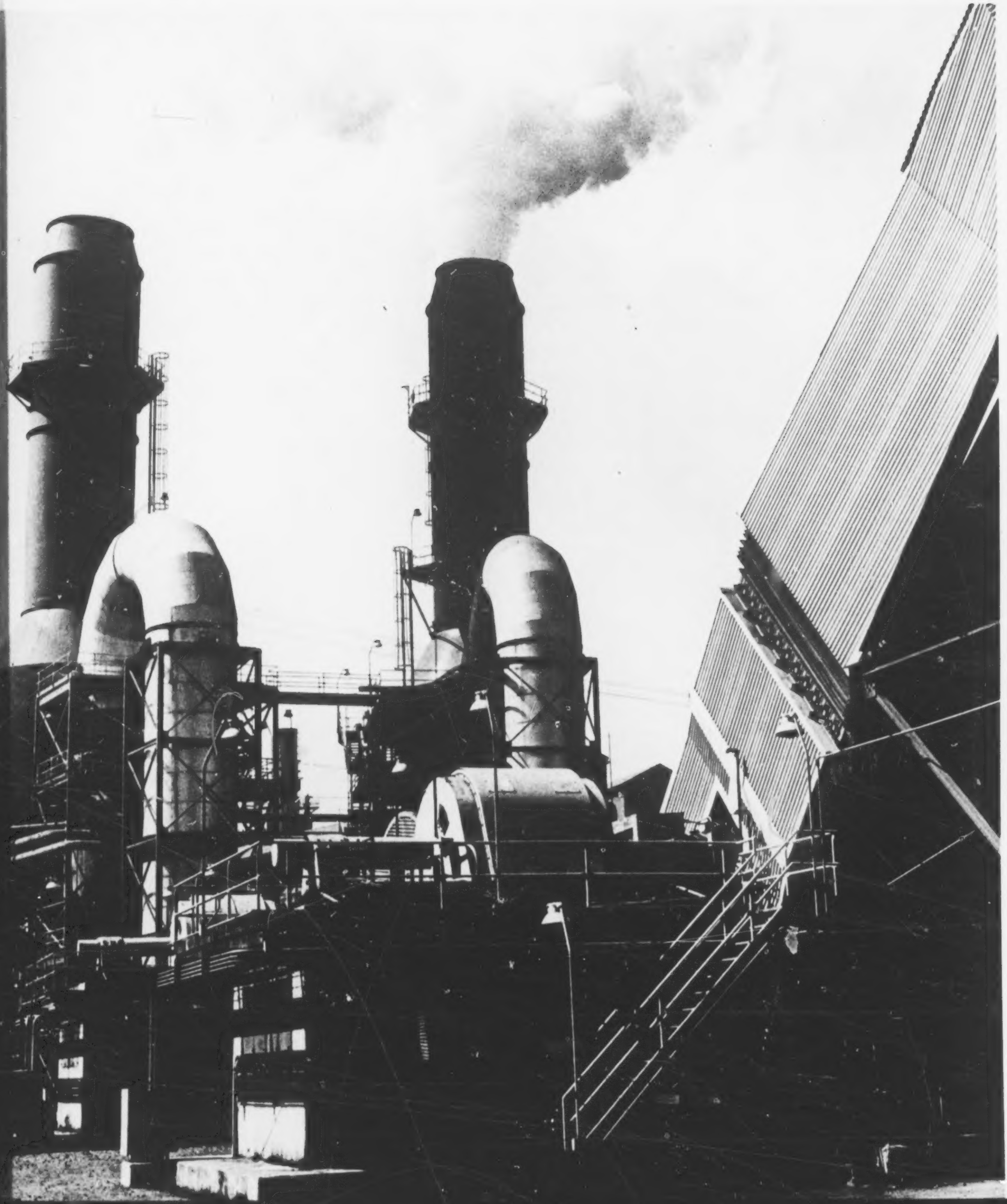
"Even those of us in industry wish Congress would come out and do something," said John Barker, longtime environmental specialist for Armco, Inc.

It's unlikely Congress will update either the clean air or the clean water law this year. "The water bill has a slight chance of passing this term," said a Washington official. "There's no chance the air act will pass." New Superfund legislation is given a shot at passage.

From a steel standpoint, the current uncertainty is possibly preferable to decisive action by either Congress or EPA. Recent experience suggests that any major change would be for the worse.

That seems to be the outlook now on standards for particulate. For years, the steel industry argued that this standard was too tight and should be reviewed. The Clean Air Act calls for regular reviews.

There was a review finally. The



Dust is removed from the sintering plant by two banks of 30 cyclones which precede the scrubbers in the cleaning train, and remove 500 lbs of dust per hour. (Photo is Bethlehem's Sparrows Point plant.)

Clean Air Scientific Advisory Committee came up with a range of dust concentrations extending from 150 to 350 micrograms per cubic meter over 24 hours. In March of 1984, EPA came out with proposed new standards.

The agency went along with one industry contention. "They're saying we should measure inhalable particulates rather than total suspended particulates," said Earl Young, AISI vice president.

Steel producers have long contended that coarse particles—over 10 microns—could be injurious to health only if they hit a man over the head. EPA acted on this thinking but proposed tight limits—150 to 250 micrograms per cubic meter. The existing standard, for all particular sizes, is 260 micrograms.

"The effect on the industry would be the same as if they hadn't made the correction," said Dr. Anderson of Bethlehem.

Secondary Standard

In another move, EPA has come up with a new secondary standard for particulates. Secondary to health are such things as property damage, impact on farming and aesthetics.

"For secondary, they're saying total suspended particulate," said Mr. Young. "They've given us a range that is at, or below, the present primary standard."

In short, the steel industry is back to square one on particulate. Steel people would like to see the whole secondary standard dropped. That, in effect, is the current status. There is a secondary standard but because of uncertainty about federal policy, the states haven't bothered with enforcement.

If it goes through, the new secondary standard will have full legal force and as has been indicated, it could cost industry $14 billion. No final action has been taken and the cost estimate could be high by as much as 100 pct.

"If they go toward the top of the range, then conceivably we could have zero additional air cost," said Dr. Anderson.

Without any change in the proposed range, the new primary standard for particulate could turn out to be helpful in many cases. It depends on the effect of going from total particulates to only inhalable particulate.

"That means some areas which were in compliance with total suspended particulate may not be in compliance with the fine fractions," said Bruce A. Steiner, director of environmental engineering for Armco. "New control programs may have to be implemented.

"That is not the tendency," Mr. Steiner is quick to add. "The tendency is for the PM-10 standard to be more easily met than the total particulate standard. So on the basis of the new primary, health related PM-10 standard, the chances are that more areas will be attaining the standard than was the case in the past.

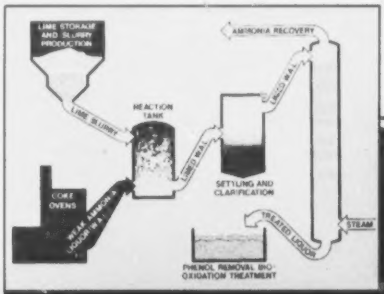
"We have done a substantial amount of monitoring work in the vicinity of most of our major plants to measure those finer fractions. When it comes to the finer fractions, we're generally in pretty good shape. Now, for some other steel companies, that is not the case. They feel they may have a problem with that proposed standard."

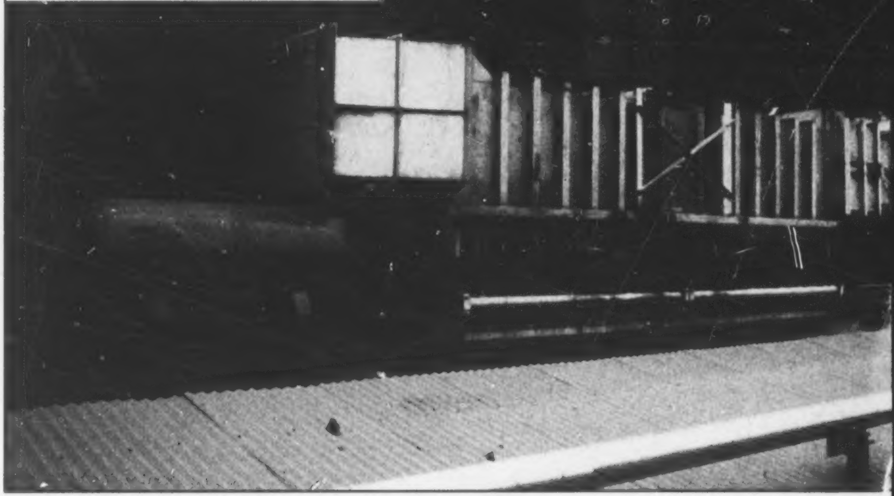
The big concern, said Mr. Steiner, is with the proposed welfare standard. "In most areas, that would mean additional controls. That's more the basis for petitioning a review than the PM health standard."

The petition, filed by AISI in the District of Columbia Appeals Court, seeks a review of the criteria used for both particulate and sulfur oxide standards. EPA's criteria document doesn't "accurately reflect the latest scientific knowledge," said AISI.

On another front, the Superfund is a constant source of worry. Designed to clean up contamination that is too old or too big for an individual company to handle, the Superfund is supported by taxes on chemical feedbacks. There is agitation for a larger fund with a larger tax base.

"Far too little has been done to clean up the thousands of sites threatening the health of citizens around the country," said U.S. Rep. Robert Edgar (D., Pa.), a member of the House water resources subcommittee.


LIME STORAGE AND SLURRY PRODUCTION
LIME SLURRY
REACTION TANK
COKE OVENS
WEAK AMMONIA LIQUOR (W.A.L.)
LIMED W.A.L.
SETTLING AND CLARIFICATION
LIMED W.A.L.
AMMONIA RECOVERY
STEAM
TREATED LIQUOR
PHENOL REMOVAL BIO-OXIDATION TREATMENT



A one spot quench car at one of Inland's coke batteries. At left is a diagram showing ammonia distillation at Bethlehem.

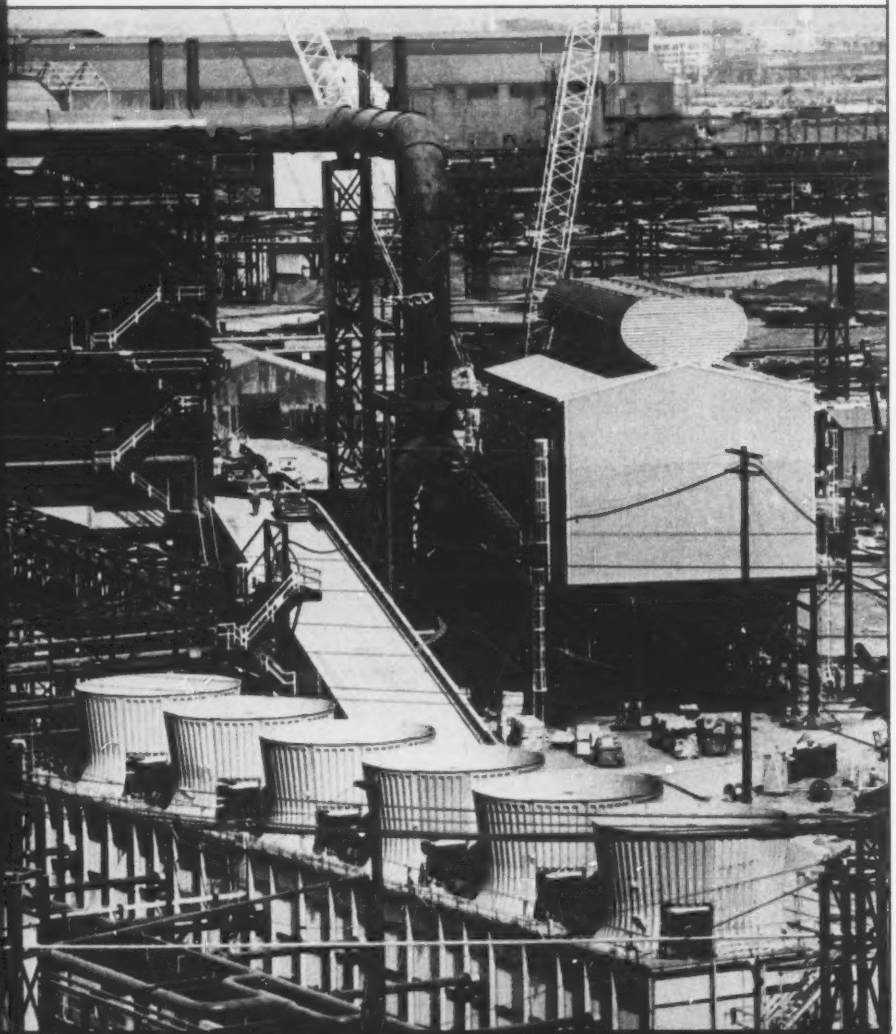
Mr. Edgar charged that the Administration was dragging its feet on reauthorization of the Superfund legislation. This isn't due for renewal until 1985, but proponents are anxious to get an expanded version in place ahead of schedule.

The original plan was to provide $1.9 billion for use over five years. Now proposed is $9 billion over the same period. Steel producers feel the huge increase is foolish.

"It's creating a giant sum of money that is going to be misused and squandered in attempts to clean up these hazardous waste sites before the appropriateness of cleaning those sites up has been fully studied," said Bruce Steiner of Armco.

The added Superfund money would come from taxing a lot more industrial materials. Proposals for taxing coke and pig iron have been dropped, but taxes on coal chemicals, electric furnace dust and pickling acid are still being considered.

Steel producers argue that the proposed taxes are unfair. "We haven't really been involved in these abandoned waste dumps for which the Superfund is intended," said Mr. Steiner. "We have relatively large tonnages of relatively low hazard waste."



Shown here is Bethlehem's $25 million environmental control installation at its blast furnace at Sparrows Point.

This combination would mean heavy taxes on materials that do no harm, he indicated. One estimate placed the tax cost of active proposals at $50 million.

Additional Testing

Closely related is the board field of solid waste disposal. One immediate concern is that a more aggressive leaching test will be used to determine hazardous content. The more stringent the test, the more likely it is that minute amounts of contaminant could force special handling of large masses.

A specific ruling by the EPA science advisors has classified coke oven emissions as carcinogenic. "That leads automatically to listing these things as hazardous air pollutants and then development of an emission standard by EPA," said Dr. Anderson.

The standard will apply to all coke batteries, old and new. It could lead to further shrinking of coking capacity.

Acid rain continues to generate conflict and confusion. The Senate Environment and Public Works Committee recently reported a bill that calls for reducing sulfur dioxide emissions 10 million tons a year. Before such a sweeping measure is enacted, more study is needed, said Sen. Jennings Randolph (D., W.Va.).

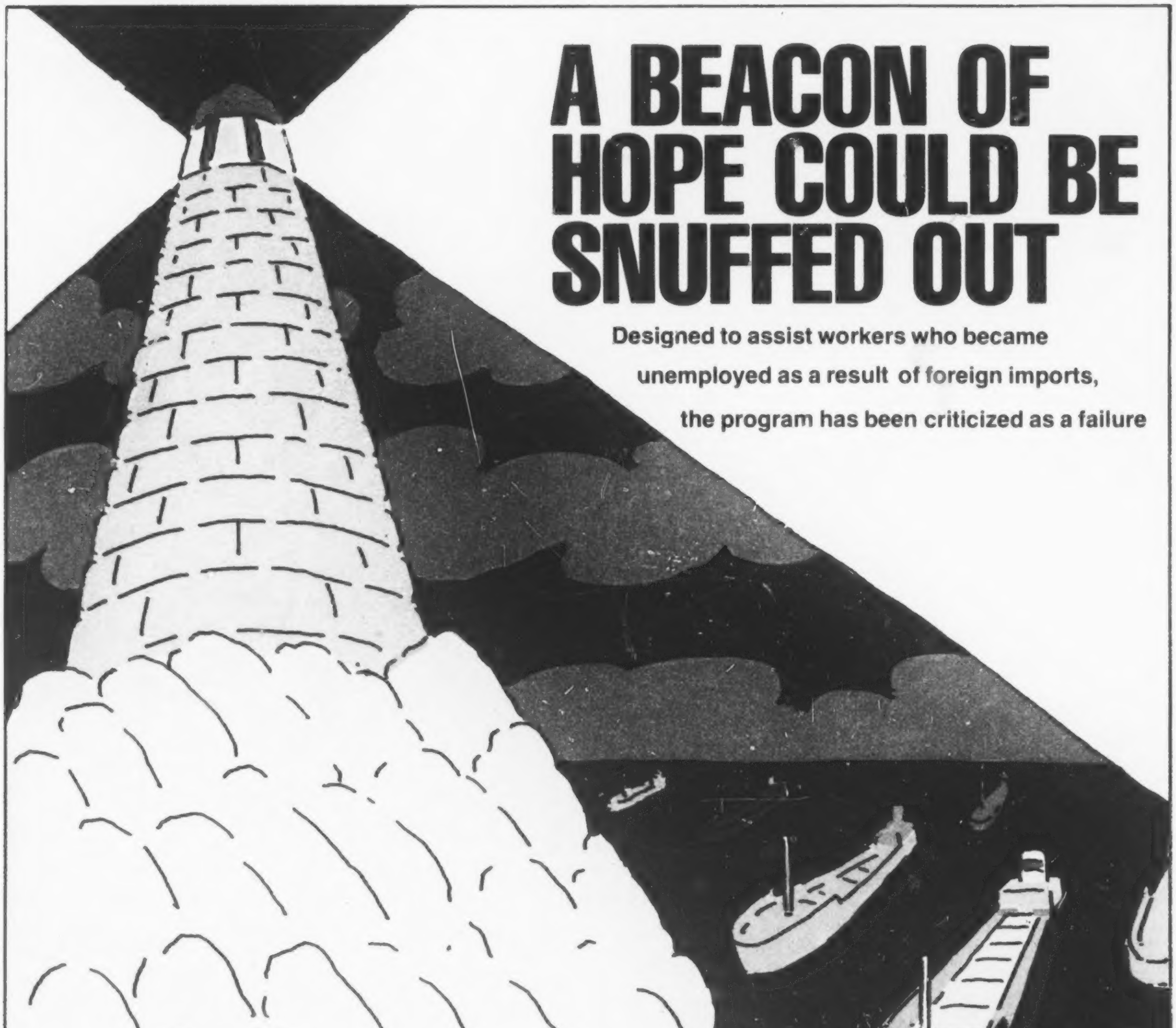
"It is crucial that irreversible commitments not be made early in a sulfur emissions reduction program," said Sen. Randolph.

The National Coal Assn. has been pounding away at what it calls "the Acid Rain Fraud." The association charges distortion and exaggeration by the proponents of the acid rain curbs.

With regard to the general regulatory climate, steel men are philosophical. "I think they've attempted to put peace back into environmental enforcement," said Mr. Masciantonio.

Dr. Anderson said the highly publicized events at EPA meant little to companies. "I think the effect of the Gorsuch administration was overdrawn. We did not find much difference and it's really not much different since then." ☐

Reprints available while supply lasts. For single copy, circle No. 73 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1042



A BEACON OF HOPE COULD BE SNUFFED OUT

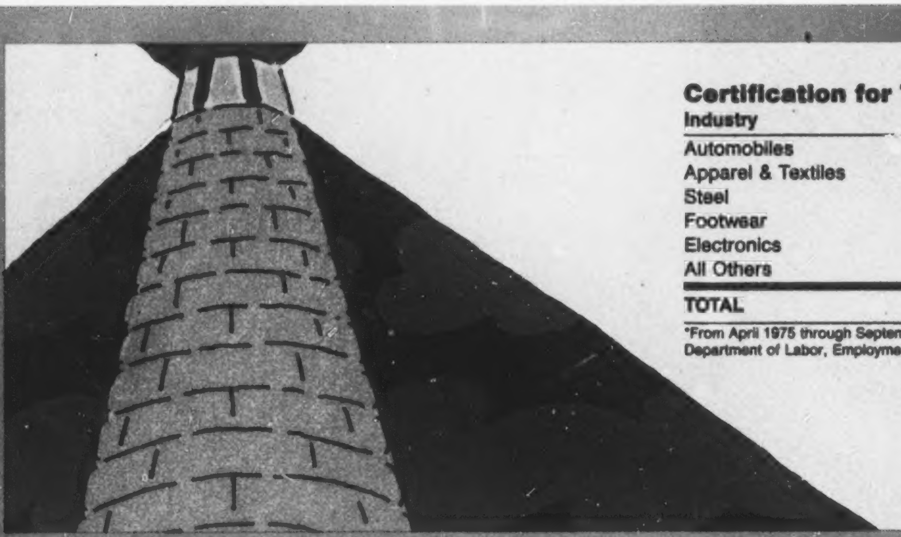
Designed to assist workers who became unemployed as a result of foreign imports, the program has been criticized as a failure

BY EDWIN W. BOWERS

Attacked by President Reagan, rescued by the Congress and called "a sort of failure" by others, Trade Adjustment Assistance (TAA) survives as a beacon of hope for many unemployed workers.

Since April 1975, about 1.5 million workers have been certified to receive TAA by the government. Yet critics call it a "failure" because, they claim, it is not doing what it was designed to do. TAA supporters disagree.

With a current budget totalling $70 million, the program is designed to provide workers unemployed as a result of im-



Certification for TAA by Industry

Industry	Certified Workers*
Automobiles	727,000
Apparel & Textiles	178,000
Steel	159,000
Footwear	79,000
Electronics	62,000
All Others	226,000
TOTAL	1,431,000

*From April 1975 through September 1983. All data from the U.S. Department of Labor, Employment and Training Administration.

ports with three aids. First, additional income over and above unemployment insurance, second, money for training in new career opportunities and, third, financial assistance to re-locate for a job elsewhere in the country.

When first created in 1962, TAA was viewed as a creative approach toward solving the problems of workers displaced by foreign imports. But in late September, 1983, Sen. Bob Dole (R., Kan.) observed: "I have never known a program that promised so much and gave so little as the trade adjustment program."

"TAA failed," Labor Department analyst Steve Charnovitz charged "because its adjustment tools were never used. The most important tool—training—was not used because the state agencies lacked the money to do so."

"I think currently the states are doing a pretty good job," responded Marvin Fooks, Director of Labor's Office of Adjustment Assistance in an interview with *Iron Age*. "After all," he said, "it wasn't until 1981 that we had a line item in the budget for training. In all the previous years we had to fight among half a dozen other national programs to try to get an allocation for training."

In 1962, the U.S. put in place a special compensation program specifically for workers displaced by imports. The 1962 Trade Expansion Act enabled workers injured by trade liberalization to apply to the U.S. Tariff Commission—now the International Trade Commission (ITC)—for adjustment assistance. Then, however, the conditions for help were strict. Workers had to prove: Imports of the product in question were increasing, the increase was caused in "major part" by trade concessions and the major cause of injury to the industry was the import's surge. It was not until seven years later that the first petition for worker assistance was approved.

Liberalization

The 1974 Trade Act liberalized the program in several ways. For example, the criteria used to show import damage were relaxed. No longer was it necessary to prove that an increase in imports was caused by trade concessions. It was sufficient to show that an upsurge in imports contributed "importantly" to a layoff. Also, certification authority was moved from the ITC to the Labor Department. By 1976 almost 143,000 workers were certified, nearly three times the number during the entire 12 previous years.

In 1980 large layoffs in the auto industry were certified as eligible for TAA. The cost of the program exploded without warning. The Fiscal Year, 1980, cost was $1.6 billion, a 533 pct increase over the previous year.

According to Mr. Charnovitz, when President Reagan took office the program was in notable disorder. He claims benefits were badly delayed, training was rarely provided, the mandatory training requirement in the law was never used, fewer than one percent of the unemployed workers got job search relocation assistance and only a tiny amount of the total TAA spending went for adjustments. "Although benefits were supposed to reach workers soon after layoff the average worker waited 14 months," Mr. Charnovitz said. Mr. Fooks conceded, there have always been "administrative bottlenecks" just because of the nature of the program. "From our vantage point," he said, "there is a slow response time by workers in filing their petitions. Frequently they don't realize their layoff is permanent. And remember the government's greatest periods of activity in this area coincide with the periods of rising unemployment, and that includes the government, so we have been very understaffed."

Mr. Fooks cited statistics. He said in the first eight months of 1975 the government received about 200 petitions for assistance. By 1980 we had certified for assistance about 5,000. "And that doesn't really tell you the whole story, because we also received thousands of requests that were not acceptable but which we still had to process."

"The U.S. is currently the only developed nation which attempts to distinguish import-displaced from other displaced workers in its labor market policy," said University of Massachusetts Prof. Michael Podursky.

Gradually, according to Mr. Charnovitz, the government did move away from providing intended adjustment services and changed the program into a "de facto compensation" program. "Once TAA was considered compensation, it became hard to justify why trade-affected workers deserved more money than other unemployed workers," Mr. Charnovitz said.

President Reagan, addressing the Congress in 1980, asserted that with TAA "we wind up paying greater benefits to those who lose their jobs because of foreign competition than we do to their friends and neighbors who are laid off due to domestic competition. Anyone must agree this in unfair."

Opposition to Program

Mr. Fooks conceded the Administration opposes the program. "At the time TAA came up for budget re-authorization," he said, "the Administration's original plan was to let it lapse, but at the last minute the House of Representatives and the Senate demonstrated their interest in continuing it, so the Administration went along. The White House believes there is too much overlap with unemployment compensation programs, for example.

"Yes, the Administration felt it was unnecessary and recommended it be terminated, the Congress didn't agree," said Mr. Fooks.

Mr. Charnovitz claimed the agencies charged with responsibility for TAA "disapproved" of it. "Although one usually thinks of bureaucrats as being protective of 'their' programs," he said, "TAA never became effective because it ran afoul of the decategorization and decentralization of manpower programs started under the Administration.

"As a result, neither the Labor Department nor the states provided the staff necessary to avoid enormous delays in benefit delivery. In addition, job search and relocation never got off the ground because state governments were politically uninterested in them," Mr. Charnovitz said.

Asserting TAA has not worked, Mr. Charnovitz said, if it had, "it could have, in the context of 'industrial policy' served as a model—and as an experiment "for a broader adjustment program to help all workers affected by technological changes." But, the Labor analyst said, the poor experience with TAA does not encourage belief in our ability to carry out ambitious and complex strategies like industrial policy.

Nevertheless, said Mr. Charnovitz, to call TAA a failure is to misstate the degree to which it has been implemented. "In terms of its adjustment potential, TAA has never really been tried."

"What is required is a more activist policy in which structural change is anticipated and a broad segment of the labor force is assisted in adjustment," said Prof. Podgursky. The Massachusetts scholar uses the term "labor market policy" to describe government's role in assisting displaced workers.

Labor market policy should accelerate the re-employment of displaced workers through various mobility and re-training programs to reduce the social costs, Prof. Podgursky said. Second, it should help to spread the cost of structural change in a more equitable manner, thereby diffusing political pressures for restrictive industrial and trade policy.

Alternative

Mr. Charnovitz proposes a program of reform with three major points. He calls for increased funding to pay for the training of all workers with poor employment prospects. "Although it is hard to predict how much money would be needed, about $85 million would have paid for training one-third of the workers certified in 1983."

He said the relocation program should be removed from local governments because they cannot be expected to give it emphasis. "The Federal government should run relocation or contract it out using a system of reimbursement tied to successful job matches."

Also, he said, claimants receiving Trade Readjustment Allowances (TRA) should be interviewed more frequently to prevent abuse. TRA is a weekly payment lasting for up to one year equal to 70 pct of the previous wage.

Added Prof. Podgursky: "A new apprenticeship Tax Credit should be provided to employers who set up registered apprenticeship programs. Such a tax credit would provide an incentive that state apprenticeship field staff could offer to employers to encourage the development of new apprenticeship programs and the expansion of existing programs.

Employers might receive a basic tax credit tied to the wages paid to workers participating in a registered apprenticeship program and a supplemental credit for hiring certified dislocated workers as apprentices."

Concluded Mr. Charnovitz: "The poor experience with TAA does not encourage belief in our ability to carry out ambitious and complex strategies like industrial policy. In the absence of effective TAA, Congress and the Administration will continue to face no-win trade policy decisions. Either limit foreign imports, which costs the consumer in dollars and choice, or permit increased imports, which creates pockets of unemployment and community disruption." ☐

Reprints available while supply lasts. For single copy, circle No. 71 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1040.

PRICE & PRODUCTION DATA

(Effective June 18, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	222	245	254	203
Pittsburgh	247	259	11	32
Youngstown	94	121	301	199
Lake Erie	144	159	147	115
Detroit	149	162	185	134
Chicago	459	503	578	408
Cincinnati	109	109	130	97
St. Louis	83	86	91	74
Southern	205	218	232	137
Western	89	91	90	85
U.S. Production	1,801	1,953	2,116	1,593

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective June 18, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,801	1,953	47,664	36,774
Capability Utilization Rate	69.3	75.2	76.7	52.9

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 5/14/84)	27.405	27.405	27.405	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 85.17	$ 85.17	$ 89.50	$ 70.83
No. 2 bundles	$ 56.17	$ 56.83	$ 60.17	$ 46.17

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 94.50	$ 94.50	$100.50	$ 72.50
No. 1 steel, Philadelphia	80.50	80.50	82.50	68.50
No. 1 steel, Chicago	80.50	80.50	85.50	71.50
No. 1 bundles, Detroit	87.50	87.50	92.50	71.50
Low Phos., Youngstown	89.50	89.50	98.50	75.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	100.50	98.50
No. 1 mach'y cast., Chi	117.50	117.50	117.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective June 18, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	67.00-68.00	68.00-70.00	6/12/84
Lead	28.00-30.00	27.00-30.00	6/13/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	52.00-53.00	53.00	5/3/84

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$2.25
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$367.90
Indium, dollars per troy oz.	$2.50-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$322-$330
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.475
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

June 11—574.37
June 12—574.09
June 13—577.14
June 14—576.54
June 15—575.61

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	64	63½
Yellow brass	59¾	59¾
Red brass	61	61
Comm. bronze	61¼	61¼
Mang. bronze	58	54¼
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	59
No. 2 copper wire	49
Light copper	40

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	45
Light copper	36
No. 1 composition	55
No. 1 comp. turnings	53
Hvy. yellow brass solids	38
Hvy. yellow brass turnings	36
Radiators	43

Aluminum

New mixed clips	45	—46
Old sheet	42	—43
Old cast	42	—43
Clean dry borings	43	—44

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	41	—42
Mixed L.C. clips	37	—39
Old sheets and cast	33	—34
Borings and turnings	26	—27
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	37	—38
Radiators	36	—37
No. 1 composition	44	—45
No. 1 composition turn'gs	41	—42
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	45	—46

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	60	— 70

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE JUNE 18, 1984

(Effective June 18, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 94.00 to	$ 95.00
No. 2 hvy. melting	84.00 to	85.00
No. 1 dealer bundles	111.00 to	112.00
No. 1 factory bundles (auto)	101.00 to	102.00
No. 2 bundles	59.00 to	60.00
No. 1 busheling	107.00 to	108.00
Machine shop turn	16.00 to	17.00
Shoveling turnings	52.00 to	53.00
Cast iron borings	51.00 to	52.00
Low phos. punchings plate	114.00 to	115.00
Heavy turnings	87.00 to	88.00
No. 1 RR hvy. melting	108.00 to	109.00
Rails 2 ft. and under	122.00 to	123.00
Scrap rails, random lgth	107.00 to	108.00
RR specialties	120.00 to	121.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	580.00 to	590.00
18-8 turnings	480.00 to	490.00

Chicago

No. 1 hvy. melting	$ 80.00 to	$ 81.00
No. 2 hvy. melting	76.00 to	77.00
No. 1 dealer bundles	109.00 to	110.00
No. 1 factory bundles (auto)	112.00 to	113.00
No. 2 dealer bundles	59.00 to	60.00
No. 1 busheling	102.00 to	103.00
Shredder scrap	100.00 to	101.00
Machine shop turn	44.00 to	45.00
Mixed bor. and turn	45.00 to	46.00
Shoveling turnings	51.00 to	52.00
Cast iron borings	51.00 to	52.00
Low phos. forge crop	120.00 to	121.00
Low phos. punchings plate ¼ in. and heavier	131.00 to	132.00
Low phos. 2 ft. and under	125.00 to	126.00
No. 1 RR hvy. melting	102.00 to	103.00
Scrap rails, random lgth	99.00 to	100.00
Reroller rails	107.00 to	108.00
Rails, 2 ft. and under	123.00 to	124.00
RR couplers and knuckles	105.00 to	106.00
RR car axles	129.00 to	130.00
No. 1 machinery cast	117.00 to	118.00
Cupola cast	108.00 to	109.00
Stove plate	106.00 to	107.00
Steel car wheels	115.00 to	116.00
Stainless		
18-8 bundles and solids	540.00 to	550.00
18-8 turnings	440.00 to	450.00
430 bundles and solids	130.00 to	135.00
430 turnings	95.00 to	100.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to	$ 82.00
No. 2 hvy. melting	69.00 to	72.00
No. 1 dealer bundles	90.00 to	93.00
No. 2 dealer bundles	48.00 to	51.00
No. 1 busheling	90.00 to	93.00
Shredder scrap	94.00 to	97.00
Machine shop turn	29.00 to	32.00
Mixed bor. and turn	29.00 to	32.00
Shoveling turnings	43.00 to	46.00
Low phos. 5 ft. and under	95.00 to	98.00
Low phos. 2 ft. punchings	115.00 to	118.00
Electric furnace bundles	108.00 to	111.00
RR specialties	100.00 to	103.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	70.00 to	73.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 60.00 to	$ 61.00
No. 2 hvy. melting	57.00 to	58.00
No. 1 dealer bundles	87.00 to	88.00
No. 2 bundles	40.00 to	41.00
No. 1 busheling	86.00 to	87.00
Drop forge flashings	55.00 to	56.00
Machine shop turn	47.00 to	48.00
Mixed borings and turn	26.00 to	27.00
Shoveling turnings	48.00 to	49.00
Cast iron borings	41.00 to	42.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	455.00 to	465.00
18-8 turnings	360.00 to	370.00
430 bundles and solids	110.00 to	120.00

Youngstown

No. 1 hvy. melting	$ 78.00 to	$ 81.00
No. 2 hvy. melting	59.00 to	62.00
No. 1 dealer bundles	91.00 to	94.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turn	14.00 to	17.00
Shoveling turnings	19.00 to	22.00
Low phos. plate	88.00 to	91.00
Electric furnace bundles	84.00 to	87.00
Galvanized bundles	79.00 to	82.00

Cleveland

No. 1 hvy. melting	$ 70.00 to	$ 73.00
No. 2 hvy. melting	46.00 to	49.00
No. 1 dealer bundles	86.00 to	89.00
No. 1 factory bundles	92.00 to	95.00
No. 2 bundles	28.00 to	31.00
No. 1 busheling	88.00 to	91.00
Machine shop turn	13.00 to	16.00
Mixed bor. and turn	13.00 to	16.00
Shoveling turnings	15.00 to	18 00
Cast iron borings	18.00 to	21.00
Cut structural & plates, 2 ft. and under	113.00 to	116.00
Low phos. punchings plate	113.00 to	116.00
Drop forge flashings	60.00 to	63.00
Foundry steel, 2 ft. & under	70.00 to	75.00
No. 1 RR hvy melting	87.00 to	90.00
Rails, 2 ft. and under	120.00 to	123.00
Rails, 18 in. and under	121.00 to	124.00
Steel axle turnings	67.00 to	70.00
Railroad cast	100.00 to	103.00
No. 1 machinery cast	109.00 to	112.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 71.00 to	$ 72.00
No. 2 hvy. melting	59 00 to	60.00
No. 1 busheling	84.00 to	85.00
No. 1 dealer bundles	84.00 to	85.00
No. 2 bundles	39.00 to	40.00
Machine shop turn	14.00 to	15.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	23.00 to	24.00
Low phos. plate	98.00 to	99.00
Structural and plate, 2 ft. and under	104.00 to	105.00
Rails, 2 ft. and under	94.00 to	95.00
Scrap rails, random lgth	74.00 to	75.00
No. 1 machinery cast	79.00 to	80.00
No 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 75.00 to	$ 76.00
No. 2 hvy. melting	64.00 to	65.00
Foundry steel, 2 ft.	71.00 to	72.00
No. 1 dealer bundles	75.00 to	76.00
No 2 bundles	61.00 to	62.00
Machine shop turn	20.00 to	21.00
Shoveling turnings	26.00 to	27.00
Cast iron borings	29.00 to	30.00
No. 1 RR hvy. melting	75.00 to	76.00
Rails, random length	77.00 to	78.00
Rails, 18 in. and under	94.00 to	95.00
RR specialties	92.00 to	93.00
Cupola cast	74.00 to	75.00
Heavy breakable cast	53.00 to	54.00
Stove plate	88.00 to	89.00
Cast iron car wheels	54.00 to	55.00
Rerolling rails	87.00 to	88.00
Unstripped motor blocks	59.00 to	60.00

Birmingham

No. 1 heavy melting	$ 79.00 to	$ 80.00
No. 2 heavy melting	74.00 to	75.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 bundles	57.00 to	58.00
No. 1 busheling	79.00 to	80.00
Shredder scrap	96.00 to	98.00
Machine shop. turn	37.00 to	38.00
Shoveling turnings	48.00 to	49.00
Cast iron borings	48.00 to	49.00
Electric furnace bundles	70.00 to	71.00
Elec. furnace, 3 ft. & under	75.00 to	76.00
Structural and plate, 2 ft.	103.00 to	104.00
Structural and plate, 4 ft.	94.00 to	95.00
No. 1 RR hvy. melting	94.00 to	95.00
Scrap rails, random lgth	87.00 to	88.00
Rails, 2 ft. and under	107.00 to	108.00
Angles and splice bars	94.00 to	95.00
No. 1 cupola cast	90.00 to	91.00
Unstripped motor blocks	70.00 to	71.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	61.00 to	62.00
No. 1 dealer bundles	80.00 to	81.00
No. 2 bundles	39.00 to	40.00
Machine shop turn	8.00 to	9.00
Shoveling turnings	10.00 to	11.00
Cast iron borings	25.00 to	26.00
Low phos. 18 in. and under	98.00 to	99.00
Rails, random length	80.00 to	81.00
Rails, 2 ft. and under	95.00 to	96.00
No. 1 cupola cast	67.00 to	68.00
Heavy breakable cast	34.00 to	35.00
Drop broken cast	88.00 to	89.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn	11.00 to	13.00
Machine shop turn	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	505.00 to	525.00
18-8 turnings	400.00 to	420.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	73.00 to	75.00
Machine shop turn	14.00 to	16.00
Shoveling turnings	20.00 to	22.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	18.00 to	20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	83.00 to	85.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to	$ 48.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	36.00 to	38.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	77.00 to	79.00

Seattle

No. 1 hvy. melting	$ 71.00 to	$ 73.00
No. 2 hvy. melting	60.00 to	62.00
No. 2 bundles	42.00 to	44.00
No. 1 cupola cast	98.00 to	100.00
Mixed yard cast	85.00 to	87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	82.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	54.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn	45.00
Short steel turn.	43.00
Mixed bor. and turn	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 78.00 to	$ 79.00
No. 2 hvy. melting	64.00 to	65.00
No. 2 bundles	42.00 to	43.00
Machine shop turn	16.00 to	17.00
Crushed turnings	39.00 to	40.00
Shredder scrap	80.00 to	81.00
Cut structural plate, 2 ft. and under	103.00 to	105.00
Cut structural plate, 5 ft. and under	92.00 to	94.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	80.00 to	81.00

PRODUCER KEY

With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co , Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	26.26	33.90	33.70	31.00	25.83	22.67	19.31	31.54	34.34	50.60	69.58	73.19
Baltimore	26.28	30.72	37.59	36.83	33.68	28.80	22.05	37.10	57.45	64.70	71.71	77.05
Birmingham	24.03	31.90	32.34	30.92	25.55	23.01	19.58	29.68	49.31	58.90	68.10	74.43
Boston	32.76	37.74	42.52	45.84	35.34	30.06	22.24	38.66	47.33	51.92	59.88	65.00
Buffalo	29.86	34.53	41.01	38.75	33.76	27.29	19.47	35.74	42.73	48.21	54.88	61.76
Chicago	28.94	34.49	37.97	34.66	25.87	23.72	17.70	32.28	36.87	41.47	48.10	53.18
Cincinnati	27.68	33.79	36.41	30.60	24.04	23.97	17.90	32.47	36.40	40.83	46.27	51.76
Cleveland	27.83	33.73	37.18	36.74	27.26	27.25	18.81	36.34	40.46	44.35	48.47	55.33
Denver	33.68	38.11	40.59	36.10	34.69	28.21	21.10	44.31	50.89	59.53	67.39	75.21
Detroit	28.28	34.80	37.86	31.69	26.63	27.74	15.96	32.63	36.47	40.91	46.42	54.09
Houston	30.43	32.95	38.93	40.82	29.00	27.96	24.02	41.29	49.03	57.20	64.25	71.38
Kansas City	30.80	36.08	40.00	37.77	28.03	28.27	19.72	33.98	42.59	45.72	52.90	60.26
Los Angeles	28.51	34.50	38.37	41.32	34.21	33.35	24.34	40.22	52.74	60.63	67.36	74.03
Memphis	25.34	33.05	34.52	33.57	27.06	28.48	22.33	34.94	36.78	49.96	59.80	69.44
Milwaukee	29.35	34.89	37.85	32.28	25.03	23.90	17.58	32.83	37.09	41.82	46.73	53.60
New York	30.89	37.51	42.55	40.22	34.62	27.21	21.06	41.14	46.66	50.94	61.12	67.29
Philadelphia	23.76	34.88	40.92	44.88	33.39	28.75	20.85	39.37	46.84	53.80	65.77	72.06
Pittsburgh	33.67	39.53	43.78	34.29	37.60	29.92	21.29	30.60	43.01	49.15	55.93	63.28
Portland	28.96	32.08	36.73	36.93	32.88	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	28.41	33.00	38.86	40.69	36.05	31.65	25.96	41.80	53.25	61.50	71.06	76.09
Seattle	24.08	32.19	36.23	34.23	24.23	27.32	25.75	39.45	52.66	65.10	73.74	78.35
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	37.31	34.14	26.19	23.48	18.40	33.76	37.79	42.74	49.38	53.69
St. Paul	28.18	32.65	35.91	37.69	26.91	24.27	17.70	33.96	36.81	41.49	46.69	52.95

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes —I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 72. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10, U1	$453.00
R3	$453.00
Midwest	
R3, U1, W5	$453.00
S1	$420.00
C10	$453.00
K2	$453.00
W5	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3, C10	$492.00
B3	$492.00
Midwest	
W8, W5, C10	$492.00
U1	$492.00
R3	$492.00
S1	$459.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1	22.05
W3	22.05
N4	22.55
W5, S1	23.75
U1, B3	23.75
G2, I3, M2, R3, G3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
U1	38.30
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
S1, J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, G3, R3, W3, J3, G2, I3	22.05
A7	22.05
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	24.60
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, G2, G3, I3, M2, R3, W3	22.05
D1	22.05
J3	22.05
I4	22.45
U1, W5, S1, B3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
I3, G3, R3, M2	26.15
G2, W3, M11	26.15
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1	28.00
I3,	28.00
A7, R3, Y1	28.00
G2, W3, M11	28.00
U1, W5, S1	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1	29.65
A7, I3, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

†Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1,	27.74
B3	26.32
Midwest	
U1	$27.74
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.49
J3	21.49
U1	22.37
W3	21.49
W5	21.49
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$23.83
Midwest	
J3	$24.01
M11	24.01
I3, W5	24.01
W3	24.01
U1	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$19.70
Midwest	
M11	$18.93
W5	18.93
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
B3(3), J3	25.80
U1, C10	25.80
Midwest	
A7, I4	23.95
U1, I3, C20, N4	25.80
R3, T10	25.80
K2	25.80
I3	19.50*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
M1	23.025
B4, C10	31.00
Midwest	
B5, W10, Y1, W8, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
P3	19.85 + CMS
W14	22.20
J3(3)	31.00
J3	31.00
West	
B5	34.90
R3	37.15
South	
B5	32.85
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10, U1	27.95
R3	27.95
J3	27.95
Midwest	
A7, U1, R3	27.95
I3, C10	27.95
I4	26.10
I3	21.00*
West	
B3	27.95
B5	18.50
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	37.90
M1	28.025
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	34.25
Midwest	
R3, C10	37.35
C2	28.275
J3, W10	34.85
P3	22.75
B1	37.30
N9	34.85
L2	34.65
B5	37.10
J3	36.00
J3	34.85
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3(2), U1	25.75
L4	25.75
P2	25.75
J3	26.75
Midwest	
B3, R3, S1	25.75
I3	24.25
J3, A7	22.80
U1, I4	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3, J3	33.55
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	33.55
G2, G3	33.55
I4, U1	33.55
West	
B3	32.05
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRICES ON AN EVEN KEEL IN MAY

For the second consecutive month producer prices were unchanged, an indication to some observers that the economy is not overheating.

"We're not going to have a significant acceleration in inflation this year," predicted economist Donald Ratajczak of Georgia State University. "To be able to say that in the second year of a recovery is important."

The unchanged level in both May and April follows a 6.0 pct rise on an annual basis during the January-March period.

Excluding food prices, the producer price index rose only 0.3 pct in May, about the same in the previous three months, the Labor Department said.

The index for capital equipment, which makes up about 22.2 pct of the government's producer price index, moved up 0.2 pct in May, after rising 0.3 pct in both March and April.

The rate of increase for the producer price index for January through May when figured yearly is 3.5 pct, well below the 5-6 pct range widely forecast for this year.

Increases were registered for heavy motor trucks, agricultural, textile and woodworking machinery and fans and blowers. Prices for metal-forming machine tools rose 0.5 pct while those for metal-cutting machine tools dropped 0.1 pct.

Lower prices for copper, precious metals, lead and flat glass were primarily responsible for a 0.5 pct decline in the index for durable manufacturing materials, the sharpest drop in more than a year. Increases for steel mill products and cement, however, partly counteracted those declines.

The White House said the producer price figures coupled with the small—0.4 pct—rise in industrial production in May, provide "a double shot of confidence that the economy is not overheating. Inflation remains low and industrial production is moderating to sustainable levels."

Latest Month Covered: May 1984

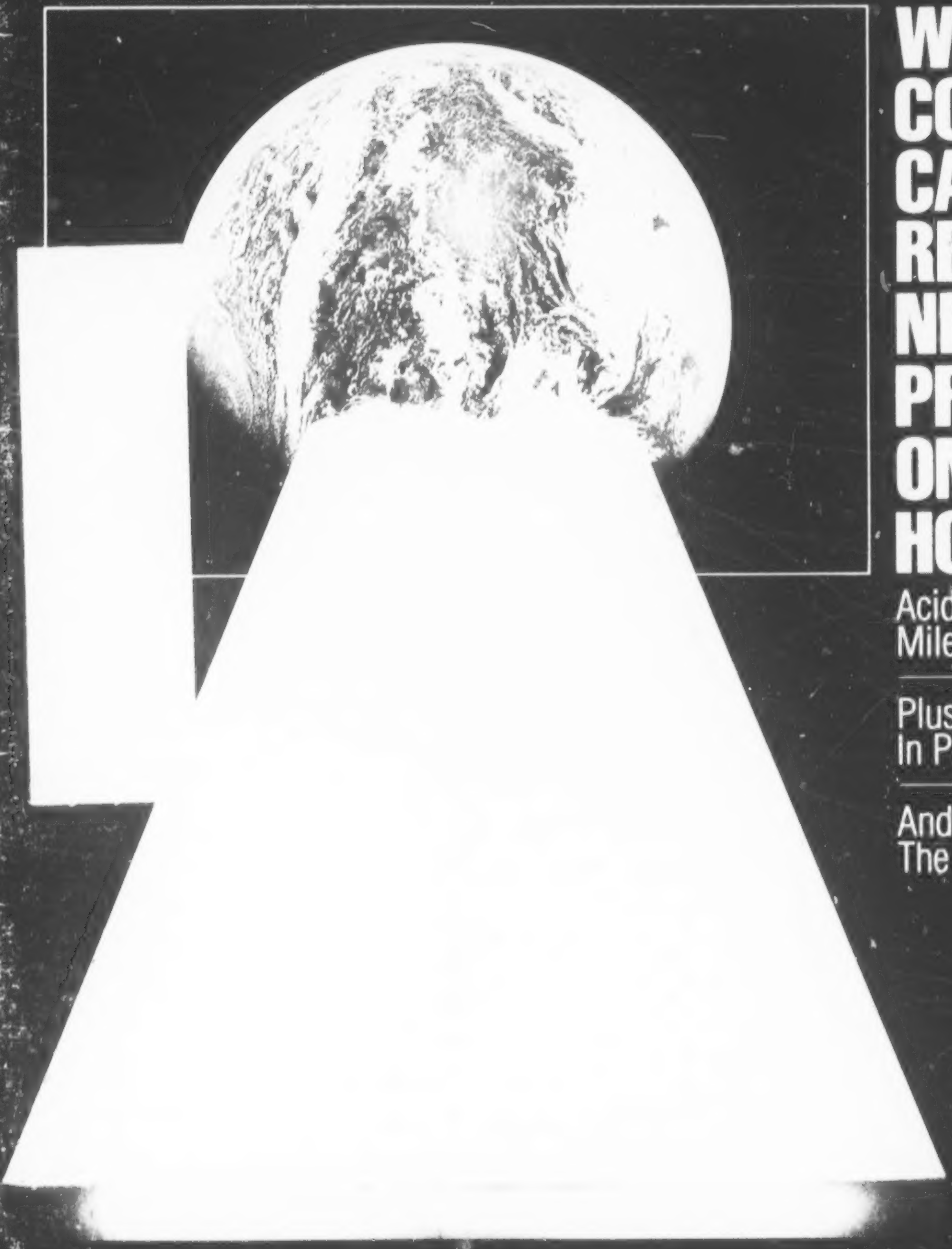
Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	383.1	− 0.1	+ 1.3
Metal Forming Machine Tools	423.3	+ 0.5	+ 2.0
Agricultural Machinery & Equip.	337.1	+ 0.5	+ 3.3
Construction Machinery & Equip.	357.8	+ 0.1	+ 1.6
Industrial Process Furnace & Ovens	374.2	+ 0.7	+ 3.7
Industrial Material Handling Equip.	287.7	0	+ 1.0
Pumps, Compressors & Allied Equip.	348.3	− 0.3	+ 0.2
Fluid Power Equip. (Dec: 1970 = 100)	257.2	− 0.1	+ 2.0
Mechanical Power Transmission Equip.	323.7	+ 0.2	+ 2.6
Automobiles	221.3	− 0.3	+ 1.9
Motor Trucks—Light	282.4	0	+ 4.6
Motor Trucks—Heavy	334.7	+ 0.1	+ 7.0
Railroad Equipment	361.2	0	+ 3.1
Fabricated Metal Structural Products	310.6	+ 0.4	+ 2.8
Electric Motors	339.8	+ 0.1	+ 4.4
Valves & Fittings (Dec. 1982 = 100)	102.0	+ 0.2	+ 1.2
Ball & Roller Bearings	341.0	+ 0.6	+ 3.0
Cutting Tools & Accessories	277.8	− 0.2	+ 0.8
Heating Equipment	252.5	+ 0.9	+ 4.0
Plumbing Fixtures & Brass Fittings	301.8	+ 0.1	+ 4.4
Metal Containers	348.1	+ 0.8	+ 3.3
Miscellaneous Metal Products	293.1	+ 0.1	+ 4.4

Data based on U.S. Labor Dept.'s Producer Price Index

CHILTON'S

July 16, 1984

IRON AGE
METALS PRODUCER



WORLD CONTINUOUS CASTING REPORT: NEW PROJECTS ON THE HORIZON

Acid Rain: Coal's Three Mile Island?

Plus
In Plant Spotlight

And
The Hot Spot

JULY 16, 1984 VOL. 227, NO. 14

CHILTON'S IRON AGE METALS PRODUCER

Editorial 5
Can you buy a house at 1900 prices?

Newswatch 11
Supreme Court re-inflates EPA's bubble.

The Hot Spot 20
Chaos in steel sourcing.

Management Challenge 24
The time has come to do something about acid rain.

Continuous Casting 49
A report on new projects, worldwide.

In-Plant Spotlight 61
B&W unveils Arbed's first continuous caster.

Technically Speaking 63
Ion deposition eases forming of hard materials.

Materials Report 69
Steel looks for a rebound; aluminum still falling.

Order Trends 76
May orders showed an uptick, Commerce Dept. notes.

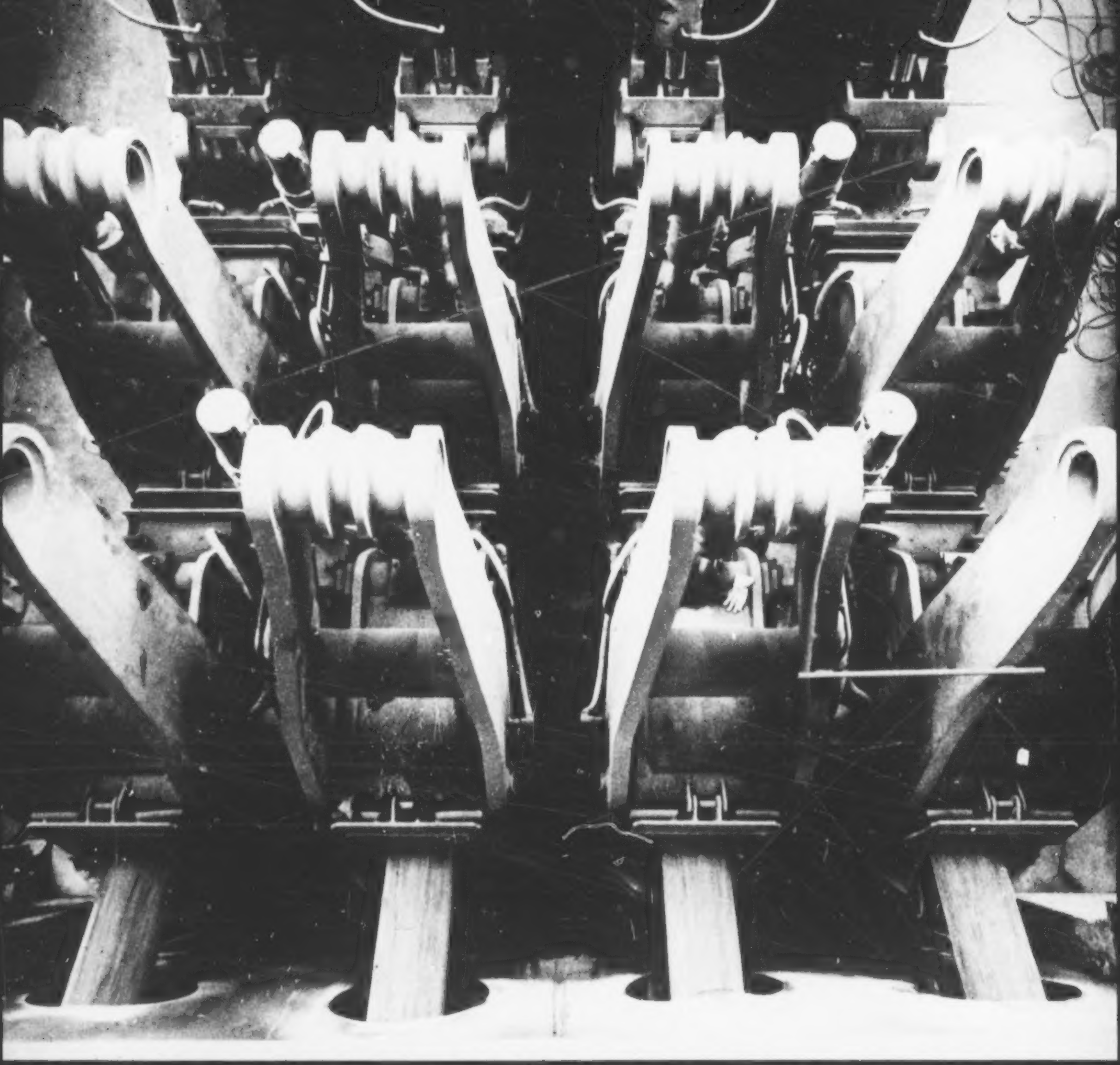
Next Issue: Vacuum Melting.

Departments

EDITORIAL STAFF 8
LETTERS 8
INDUSTRIAL BRIEFS 19
PRODUCT & EQUIPMENT REVIEW 64
AD INDEX 66
MANAGEMENT SERVICE CARD 67
BUSINESS STAFF 68
P&P DATA 7/2 72
FERROUS SCRAP 7/2 73
CLEARING HOUSE 74

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $49 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

Chilton abc
ONE OF THE ABC PUBLISHING COMPANIES



Italy's biggest caster at SETA, Brescia. Billets 420 mm diam. are produced on a Danieli continuous caster.

WORLD CONTINUOUS CASTING REPORT:

NEW PROJECTS ON THE HORIZON

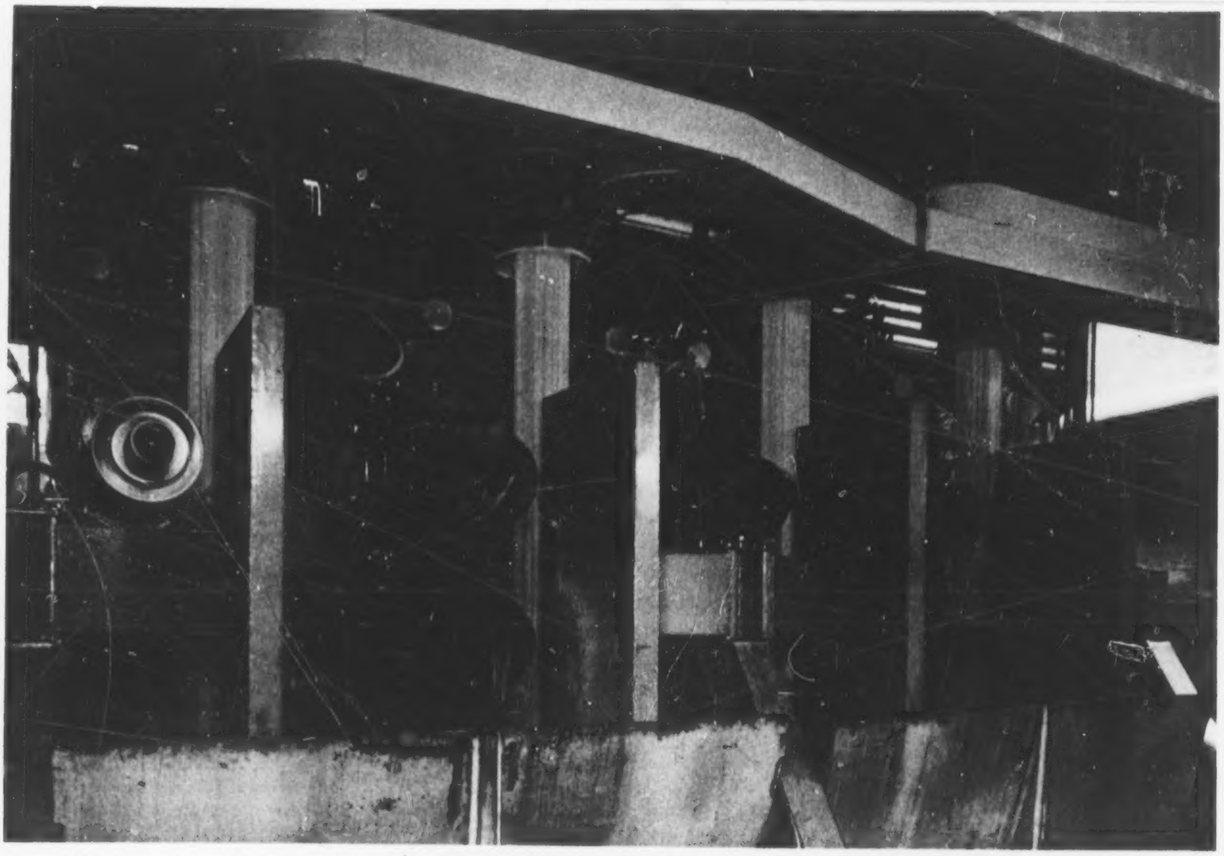
BY KEITH W. BENNETT & GEORGE A. WEIMER

Millions of tons of capacity are being added, all designed to make dramatic improvements on cost efficiencies and energy use.

World Slab Caster Report: New Overseas Interest

The U.S. has been the hottest market for new slab casters. Now, a wave of inquiries from off-shore steel plants suggest, after a two year lull, they want to get started on more new slab casters of their own.

But U.S. Steel at its Gary Works, with a new pair of slab casters for mid-1986 operation rated at 3.3 million annual tons will have the largest slab casting facility among the *New Wave* casters. It will produce 9.1 in. (231 mm) thick steel slabs in widths from 33 in. to 90 in. One of the two single strand cast-



ers will have a split mold to make narrower slabs of 33 in. to 39 in. width. Concast, Inc. will design and fabricate the state-of-the-art fully computerized machines. It will make Gary Works the biggest slab caster in the U.S.

The U.S. has 25.5 million tons of capacity in slab casters. Bypassing the process of rolling ingots can save $40 to $50 per ton of slab. U.S. plants will add 12.4 million tons between now and 1986. Slab casters used to take 24 months, but some are now coming onstream in as little as 18 months, so some casters not let yet could also be on by 1986.

Overseas capacity is hard to track, but could rise 19.25 million tons, 1983 to 1986, despite the lull in new orders overseas in 1982-1983.

North American industry reports suggest that Armco, IPSCO, Dofasco, Stelco, and National Intergroup are at least looking at more casters; and at least two casters could be announced for North American plants some time this summer. At least 13 slab casters had been scheduled to come on this year and next in foreign plants.

The new machines are big and fast. Where the early wave of slab casters of the 1950-1975 period were rated at 40 ipm (1 meter per min.), the new machines are usually rated at 65-70 ipm (1.65-1.7 m/m), while still concentrating on a slab thickness of 9 in. (228mm).

One equipment builder told *Iron Age* last year, "Companies build roughly for 9 in. slab thickness because of the limited strength of their hot strip mills. You'll see 10 in. to 12 in. thickness on slab from these casters."

This is supported by some of the new carbon steel casters like the LTV plant at Chicago. The two casters at Indiana Harbor have a 19 in. capability in thickness, matching one of the most powerful strip mills in the U.S.

Engineers say some casters could be capable of 72 ipm (1.8 m/m), but mill operators talk of slower speeds, though one LTV-Indiana Harbor machine was rated at 71 ipm. This caster is a single strand of 40-78 in. width (1016 to1081 mm). Designers say casters of 78.7 ipm (2 m/m) are feasible and rate some offshore slabbers that high. An American engineer mentioned a Japanese machine for 11 in. thick slabs at speeds over 2 m/m.

Innse of Milan, Italy is working on direct-to-mill slab projects. Photo shown is at Dalmine, in Bergamo, Italy.

Three New Casters

Bethlehem Steel will have three new casters in operation by 1986. Its first went onstream in 1975 at Burns Harbor, rated at 65 ipm (1.65 m/m) with a 1.8 million ton capacity. With the new 1985 caster at Burns Harbor, and the bigger machine (2.9 million annual tons at Sparrows Point), the company could produce a total of 6.9 million tons of slab yearly.

LTV Steel, with new casters at Cleveland Indiana Harbor, already has an apparent capacity of 4.9 million

Horizontal Steel Casting is Alive and Well in the World Market

Where is a horizontal steel casting process that really works? Davy McKee of Sheffield, England, said it has had one since 1975, but Europe was not ready for it.

Davy McKee's first production plant, a two strand installation at NKK of Japan's Fukuyama plant, commissioned in 1978, so impressed NKK they took out a license. A second plant, feeding directly through a reheating furnace to a rolling mill, has operated at NKK Nichjyu Koki since January 1981. Davy McKee, which receives all the updated operating experience from NKK, said NKK reported big prospects in the U.S. Davy McKee is equally confident about South Africa.

The only other European manufacturer which has sold horizontal continuous casting machines is Technica Guss, West Germany. This company has a single-strand horizontal caster in West Germany, a two-strand machine in the U.S. and a two-strand machine in Czechoslavakia.

According to Davy McKee, the fundamental difference between the British and German designs is that the latter is a two-strand, slow speed type, whereas the British one operates at speeds similar to conventional vertical continuous casting.

Davy McKee's research and development center began the horizontal casting of steels at an experimental setup in Stockton, England, during the mid-1960's. "We set up a pilot plant in 1975," said continuous casting research manager, Darryl Toothill at the METEC exhibition, Düsseldorf, West Germany, in June. "But the steel industry in Europe at that time was in a bad way, and showed no interest." He continued: "Three Japanese steel companies approached us for a plant and we chose NKK, which installed a two-strand machine at Fukuyama. This led to a license agreement."

It seems NKK has every confidence in the process, and the first production machine at Nichjyu Koki was commissioned within two weeks of installation and produces 105 mm square billets in carbon steels from two strands.

What's more, you would not believe the quality of scrap fed into Fuchjyu Koki's furnace—it has up to 1 pct zinc content: "Only a horizontal caster could cast that!" commented Mr. Toothill. A second machine was sold by NKK to South Korea. It produces 186 mm square billets in first quality machining grade steels, low alloy steels and spring steels, in one strand fed by a 15 ton electric arc furnace.

NKK has developed the process to produce a small bloom caster. It produces a 270 mm diam. bloom, but it can do 330 mm diam., according to Mr. Toothill. The "Horicast" process, as Davy McKee calls its tradename, will produce billets in all low and high carbon steels (0.5 - 1.2 pct C), low alloy stainless steels (martensitic and austenitic), nickel-steels and two-phase stainless steels. Casting speeds are claimed to be similar to those of a vertical caster.

What does the process offer? On the "plus" side, low capital investment under a low roof.

It is virtually 100 pct automatic: "There are no mold operators," confirmed Mr. Toothill. "Though no one has asked us or NKK, yet, for an automatic stream from a ladle, it's automatic, except for opening the ladle."

The size of the market, said Mr. Toothill, should be considerable for a small, 5-20 ton machine capable of producing a wide range of steel qualities.

Alternatively, existing users of vertical casting machines, might make use of a small additional horizontal caster to produce those aluminum-killed steels not possible in the vertical machine, or add specialty steels to the salesbook.

Are there any "minuses"? asked *Iron Age*. For one, apparently, you can't achieve high production levels. On a vertical installation, sequence casting boosts productivity.

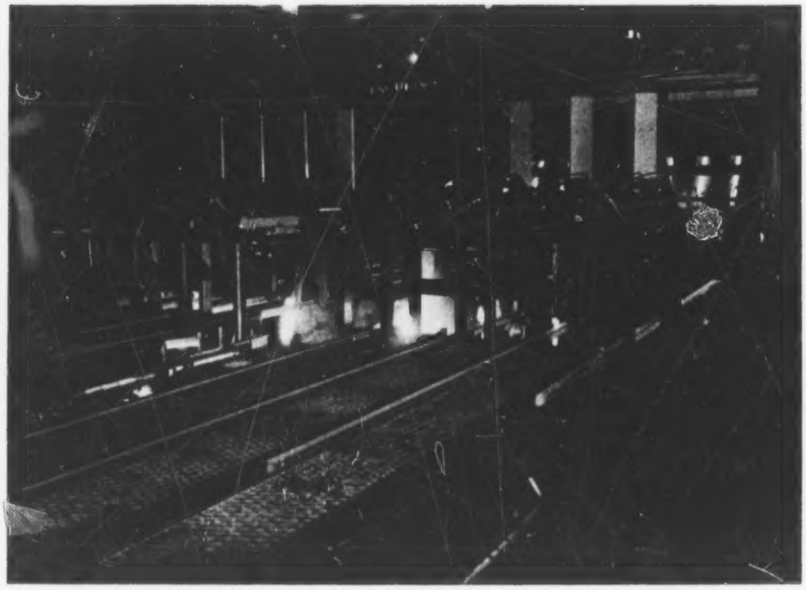
On the horizontal machine only three to four ladles can be cast in sequence. But the tundish and mold constitute a completely closed system, so metal entering the one-piece mold is out of contact with the atmosphere. Horicast machines also use spray cooling, though perhaps its not needed with stainless steels.

Mr. Toothill also says that the surface finish of Horicast products is "different" in terms of the mode of solidification. Davy McKee said that the efficiency of the Horicast mold allied with secondary cooling results in optimum solidification conditions over a wide range of casting conditions. It is claimed to result in a short liquid core with a low and symmetrical stress distribution. So there is little segregation and central porosity and freedom from cracking, even on thermally sensitive grades of steel.

Asked about the future of Horicast in Europe, Mr. Toothill said that Davy McKee has applied to the ECSC to fund a project in France. The partners would be the newly-formed Compagnie Francaise des Forges et Fonderies (CFFF or C3F—a wholly-owned USINOR subsidiary originally belonging to Creusot-Loire) and the IRSID (Institut de Recherches de la Siderurgie Francaise—Paris and Metz).

If successful, the partnership would install a prototype two-strand machine in France. No UK company has to-date expressed any interest.

Meanwhile Davy McKee and NKK continue development work to reduce maintenance and operating costs and apply Horicast to high speed steels.



Rokop Corp. has built an 8 strand billet continuous caster for a facility at British Steel Corp.

Slabs are flame cut as they leave the continuous slab caster at Bethlehem's Burns Harbor Ind., plant.

tons per year. Armco Steel with one carbon steel caster of 1.02 million annual tons and two large stainless and specialty steel slab casters, already has a 1.8 million annual ton apparent capability. Since the new slab casters in development appear to average about 1.5 million annual tons, if Armco elected to go for a fourth caster it could arrive at a total 3.3 million annual ton of annual capacity.

Inland Steel company, by 1986, will have two new casters besides the 1.8 million ton caster that came onstream in 1982 which will then give the company a total 4 million tons, though one of the two machines is a two strand machine to make both blooms and slabs.

National Intergroup also is heavy in slab capacity, with a rated 3.7 million tons on its two slab casters, even after spinning off the 1.2 million tons Weirton Steel caster.

McLouth Steel (Tang Industries) is in the same heavyweight class as LTV, rating its slab thickness at 9 to 12 in. (228 to 304 mm), with a 2.2 million ton annual capacity on four single strand carbon steel machines rated at 60 to 65 ipm (1.3 m/m).

Wheeling-Pittsburgh's 1983 unit is rated at 2.4 million annual tons, so it's also part of the *New Wave* with a machine rated at a top speed of 60 ipm (1.3 m/m) for slabs of 8 in. thickness (203 mm) and 40 to 80 in. (1016 to 2032 mm) widths on a single two strand machine.

U.S. Steel has one of the oldest carbon casting machines in the U.S., dating back to 1967 at Gary. Built as a vertical caster, it was extensively modified in 1982 to give it a 30 pct capacity gain. It has continued to push up the rating on the machine. *Iron Age* has estimated that it could hit 1.7 million tons by early 1984, pouring 9.3 in. (236 mm) thick slabs in a single strand that can vary from 46 to 78 in. (1168 to 1982) width at casting speeds of 63 to 65 ipm (1.6 m/m). With its 1.14 million ton machine at Baytown, it had a capacity of 2.84 million annual tons. The *New Wave* casters at Gary could raise the total at Gary's No. 1 and No. 2 caster shops to 6 million tons. It has been speculated that the original Gary caster could, with some more work, be pushed to just about the 2 million annual ton mark.

Foreign Development

The newest overseas machines appear to be POSCO Kwangyan Steel Works in South Korea, scheduled for 1986 at 2.7 million annual tons (metric) or about 3 million U.S. tons. Mannesmann Demag rated this as a 9 in. (230 mm) thick slab, and in widths of 32 to 63 in. (800 to 1600 mm) on two twin strand machines.

At Altos Hornos de Viscaya, Spain, three single strand machines are rated at 2.6 million metric annual tons in slab thicknesses of 6.69 to 10.23 in. (170 to260 mm), and widths from 23.6 to 74.8 in. (600 to 1900

Planned for 1985 operation, a four strand caster Siderugica Lazaro Gardenas, Las Truchas, Mexico, is rated at 2 million annual tons with a slab thickness of 7.87 to9.84 in. (200 to 250 mm) and widths from 47.2 to 74.8 in. (1200 to 1900 mm).

It's a measure of the surge in slab caster, both in carbon and specialty steels (though the emphasis is on carbon casters), that Mannesmann reported 98 machines in which it has been a supplier in service last year, and 108 machines this year; aggregating 174 strands.

Concast, which pioneered with a stainless slab caster at Atlas Steel in

	Continuously Cast Raw Steel Production (In Millions of Metric Tons)			**Pct of Total Raw Steel Production**		
	1981	**1982**	**1983**	**1981**	**1982**	**1983**
Belgium	3.8	3.3	3.9	30.6	33.0	38.4
Denmark	3.8	0.5	0.5	95.8	96.8	97.4
W. Germany	22.3	22.2	25.7	53.6	61.9	71.8
France	10.9	10.8	11.2	51.4	58.5	63.8
Ireland	—	0.1	0.1	—	100.0	100.0
Italy	12.6	14.1	14.9	50.8	58.5	68.2
Luxembourg	0.3	0.7	0.8	7.0	19.4	24.1
Netherlands	1.2	1.4	1.6	21.2	31.0	35.9
United Kingdom	5.0	5.3	7.0	31.8	39.0	46.6
EEC Total	56.6	58.3	65.7	45.1	52.8	60.4
U.S.	22.2	19.6	23.6	20.3	29.0	31.2
Canada	4.8	3.9	4.8	32.2	32.8	37.4
North America Total	27.0	23.5	28.4	21.7	29.6	32.1
Japan	71.8	78.4	83.8	70.7	78.7	86.3
Korea	4.8	6.0	6.7	44.3	51.1	56.6
Taiwan	1.8	3.4	4.3	58.5	80.9	84.6

Source: IISI

Canada in 1954, reportedly shared in 14 slabbers in U.S. plants and 84 worldwide by 1983. It figured the world total for casters of all types (billet, bloom, slab) at 1144, of which it had participated in 409 by one report. Its slab caster at National's Granite City Steel plant in 1981 led off the move to variable width molds in the U.S. (49 to 84 in., or 1245 to 2135 mm).

In the 1984-1985 period, it reported eight casters outside North America scheduled for operation in carbons or alloy steels. Included are: Sociedad Mixta Siderugica Argentina, in Argentina with a machine casting carbon and alloy steel slabs in 29 to 63 in. (750 to 1600 mm) width, and 6.29 to 9.84 in. (160 to 250 mm) thicknesses, with two strands. At SIDMAR in Belgium, a two strand machine for 1985 was rated at slab widths of 47.2 to 94.4 in. (1200 to 2400 mm), and 8.62 to 9.05 in. (210 to 320 mm) for carbon and low alloy slab.

Companhia de Acero Del Pacifico, S.A., Chile listed a one-strand machine for 1984 operation at 23 to 41.3 in. (585 to 1050) width; and thicknesses from 7.28 to 10.23 in. (145 to 260 mm) thickness. At Nippon Kokan KK, Japan, at Fukuyama Works, a 1984 dated machine with two strands is rated at 31.5 to 64.9 in. (800 to 1650) width, and 8.66 to 9.84 in. (220 to 250) slab thickness in carbon steel. Spain, like Gary Works, appears to be modifying two earlier sites for 1984 operation at Empress Nacional Siderugica, A.A.; both for carbon steel casting.

Another important caster supplier is Voest-Alpine, which also figured in Sociedad Mixta Siderugica Argentina caster rated at 1 million metric tons in Argentina; as well as two, two-strand machines for POSCO (Pohang Iron & Steel Co. Ltd.) in Republic of Korea. It rated these machines at 4 million annual metric tons, for 1981 completion; the same year that Voest-Alpine brought on a 1.1 million metric ton slab caster at Linz, Austria. It also lists a two strand for 1984 operation at VE AHB in Germany, rated at 2 million metric tons in carbon and alloy steels with a top feeding system; as well as a 1.4 million metric ton pair of single strand machines for 1985 operation for Iron & Steel Projects Secretariat of Heavy Industries, Libya.

The VE AHB machine has a reported casting range of 33 to 78.8 in. (850 to 1850 mm) width, and 5.9 to 13.77 in. (150 to 350 mm) thickness. Dimensions for the Libyan machines are somewhat smaller: 24.8 to 62.9 in. (630 to 1600 mm) widths, and 5.9 to 7.87 in. (160 to 190 mm) thickness; for production of carbon and alloy slabs, as with the German machine.

Asked the casting speeds of some of the machines it has worked with, Voest-Alpine reported the Pohang (POSCO) machine was rated at a fast 70.8 to 78.7 ipm (1.8 to 2.0 m/m). A 1981 machine at Voest-Alpine AG, Linz, Austria, has a wider speed range from 42.2 to 78.8 ipm (1.2 to 2.0 m/m), on a 1.1 million metric ton machine with one strand for carbon and alloy steels; and thickness varies from 7.87 to 11.81 in. (200 to 300 mm).

Since 1973, Voest-Alpine has figured in the construction of at least five machines rated at 2 million metric tons per machine. The average reported casting speed on these machines at the top was 70.8 ipm (1.8 m/m) and three of them were cabable of at least 2 m/m. The 1.1 million ton (metric) machine at Linz could hit that top figure.

Among owners of and shoppers for new casting machines, another name heard often is Hitachi-Zosen. It is a contributor of technology in four new slab caster installations in the U.S., including the Cleveland LTV caster, Wheeling Pittsburgh, Inland Steel, and Ford's Rouge Steel. It's credited with some 30 similar jobs in Japan, besides work in Brazil, China, Korea, Taiwan, Australia and Africa.

Average Caster Size

While a lot of industry observers talk about the advent of 2 million ton slab casters in the future, a Hitachi source agrees that the average caster is more apt to be in the 1.5 million ton class, with production on two strands. It can be either spray-cooled or mist-cooled, though the newer machines tend to add mist cooling. Caster lengths are about 131 ft. (40 m) and thicknesses range from 8 to 10 in. (203 to 254 mm). And a point frequently heard gets more confirmation from Hitachi sources: Where mold length of 27.5 in. (700 mm) was once common, the feeling now is 35.4 in. (900 mm) is better.

Armco has been reported as one of the U.S. companies with some interest in a caster. But its first move will be to modify a six strand caster for 1986 completion that will consolidate two billet strands into a single slab strand. Again, this looks like it would be a 9 in. thick slab, though the company seems to have looked at possibilities from 7 in. to as much as 12 in. Like all the new slabbers, this would have a variable width mold, so that a possible range could be from 38 in. to 66 in. (965 to 1676 mm), on a single strand to make 32 ft slabs, in a metallurgical length of about 100 ft., with spray nozzle cooling.

Even spray cooling has changed over the years. Mannesmann Demag noted that from an original 1000 nozzles, wide angle flat jets allowed it to cut back to 100 nozzles. As a guess, the Armco modified caster looks capable of some 360,000 tons of slab per year.

Typically, molds now oscillate in a total 8 mm movement. A typical machine height appears to be 44 to 50 ft. Caster radius, however, can run from 33 to 88 ft., though the 88 ft. radius segment was preceded by a 48.5 ft. arc, just ahead of it in the caster. Where earlier machines had a single "unbending point", now the range is two to four; though one user and one builder point out their system has none but is a continuous curve.

Rated at 1.8 million tons, the Ford Rouge caster is for 1986 operation. The Rouge plant has been estimated at 3.6 million tons annual hot metal capacity. This is a Hitachi-Zosen and Mannesmann Demag caster, part of a consortium headed by Mitsubishi. It's a curved mold machine, with about 897 ft from mold to exit pinch roll. That two strand machine is rated at a high top speed of 72 ipm (1.82 m/m) casting rate. A BOF is the main hot metal source but could be augmented with electric furnace steel from an existing shop if it is needed.

The Bethlehem casters are scheduled for startup in 1986. The casting length here, or metallurgical length, is 116 ft. There is no slitting on the line, though some slab is cut cold as U.S. steel at Gary does for its tinplate slab. These machines have a casting radius of 33 ft., and the number of tundishes gives a clue to the auxiliary cost of a slab casting machine. With two tundishes in use, the Sparrows Point caster has a total of 13; and Burns Harbor has 10. The cam operated mold oscillator can go from 20 to 250 strokes per minute. These are straight mold machines.

As with the Inland Steel machines, these machines have variable width molds and this is the accepted future pattern for slab casters. Burns Harbor also has an auxiliary slab cutting system on line that appears to be unique, and allows hot cutting slabs to lengths as short as 6.33 ft. without waiting to cool the slab.

IPSCO, Inc., which put in an 80 in. hot strip mill in 1979 at its Regina, Sask plant, confirms that it is a candidate for a slab caster, possibly a single strand, to handle 650,000 annual tons of hot metal output. It would want a variable with mold for slabs 7 to 10 in. (177 to 254 mm) thickness as a general range; and 40 to 84 in. (1016 to 2133 mm) width at casting speeds of perhaps 1.1 m/m. But this could be a long way off, perhaps as much as 24 months.

National Steel has had long range plans for a new caster at Great Lakes. But like IPSCO, there may be some time before these are firmed up. This is an interesting plant, because its 104 in. (2641 mm) slab caster is wider than any other slab caster has ever been.

New Commitment

Dofasco, Hamilton, Ont., could be making a slab caster decision this year, company sources confirm. Dofasco has a 4.2 million ton ingot capacity and currently has two hot slabber mills and is good enough at scheduling to be able to roll the slabs hot, from hot ingot. It would look to continue direct hot rolling from slab caster to hot strip mill. It hasn't yet set a time limit on its final decision, and may not even have firmed its specs yet on what it would want in a slab caster.

Stelco put on a slab caster in 1980, a twin strand machine at its Lake Erie Works. It also has added its second hot strip mill. The present machine is rated at 1.44 million metric tons in 44.48 to79.92 in. (1130 to/2030 mm) widths; and 9.5 in. (241 mm) thickness, though a recheck suggests a range of 200 to 240 mm, or 7.87 to 9.44 in. This is a Mannesmann Demag caster with curved mold to make slabs up to 49.2 ft (15 m) weighing up to 36 metric tons.

The casting rate can range up to 1.5 m/m (59 ipm) in a machine with a 95.1 ft. (29 m) metallurgical length; and one which can put through from 1.87 to 5.79 metric tons per minute. There had been some disagreement in the reports, but apparently the Stelco Lake Erie machine couldn't change mold width "on the fly". One mold has now been converted and the entire machine can now share that advantage. The machine slits slab off-line. It's also added more secondary cooling, so that it has 10 m of spray cooling, followed by 10 m of air mist cooling.

The other caster, if approved, could be in as early as 1986 at Stelco's Hilton Works.

Wheeling Pittsburgh came in during the early part of the *New Wave,* in 1983, with its 43 to 80 in. (1016 to 2032 mm) wide slab caster. About 45 pct of its product is slit and all of it is for the hot strip mill. It mounts two tundish cars with eight tundishes and 13 ladles. It is a curved mold machine with an electromagnetic mold level control described by its users as "excellent". Metallurgical length is 82 ft. or (25 m) with a very complete use of computer control in the machine.

It is believed the machine can cast at 63 ipm (1.6 mm), though it may have been running at a slower speed.

BILLET & STRAND CASTERS

In the past two years, Mannesmann Demag has built 14 strand casters from Lorain, Ohio to India and Paraguay. These include, besides the well-known U.S. Steel-Lorain, Ohio and Bethlehem/Steelton, Pa. works, one of the smallest for Siderugica Cearense in Fortaleza, Brazil, which has a capacity of only 90,000 annual tons. The largest in the time period is Bethlehem's at Steelton with a rated capacity of 1.25 million tons.

One at Nippon Kokan's Kabushiki Kaisha Ogishima Works is nearly as large with a rated annual capacity of 1 million tons of rounds, Mannesmann Demag noted.

According to the company, the smallest strand caster it has built since 1952 is an installation at Gebr. Bohler & Co., AG, in Kapfenberg, Austria, which is rated at only 7,500 annual tons of rounds. The Bethlehem facility, according to Mannesmann Demag's records, is its largest to date.

"This plant will be one of the most efficient producers of high-quality steel rails and semi-finished steel in this country," said Bethlehem president Walter F. Williams. "It may actually be the most efficient producer in the entire U.S."

The Steelton, Pa. plant's caster, the second of four casting machines Bethlehem has earmarked for its plants, will produce "jumbo blooms, the largest blooms continuously cast in the United States," Mr. William noted.

The blooms will have a cross-section measurement of 14.6 in. by 23.6 in.

Bethlehem has been operating a continuous caster at its Burns Harbor, Ind. plant since 1975 and in 1983 announced a $500-million program to provide a continuous caster for its Sparrows Point, Md. plant and a second caster for Burns Harbor.

Sparrows Point's 2.9 million-ton-per-year caster is expected to begin operation in January 1986 and the 2.2 million-ton-per-year caster at Burns Harbor in April 1986.

The Steelton caster will be fed by the plant's electric furnace steelmaking operation, which has a rated annual capacity of 1.3 million tons. As part of Bethlehem's quality emphasis, steel from the plant's furnaces is subjected to argon stirring, a process that provides homogeneous mixing of various additives in the steel, before it is poured through the caster.

Computer System

Bethlehem has also installed a sophisticated computer system at Steelton designed to control the flow of the liquid steel into the casting machine and to track the steel from that point until it is sent on its way as cut blooms.

Once the cast blooms are cut to size and rolled into rail, each rail is subjected to the plant's new in-line, computerized, ultrasonic inspection system to ensure uniformity and cleanliness.

Mannesmann Demag has supplied hundreds of casting machines around the world and has installed and started five machines in the U.S. in the last six months.

One of the considerations for selecting Mannesmann for the project was its many years of proven experience as both a machine operator and a machine builder, Bethlehem said.

Dravo Engineers, Inc., and Dravo Constructors, Inc., were responsible for the $85-million, continuous casting facility's site preparation, demolition of existing buildings, excavation, building and equipment foundations, the casting building (complete with six electrical overhead traveling cranes), placement of all equipment including the casting machine, utility and process piping including 20,000 lineal feet of hydraulic piping, electrical equipment, power distribution and control wiring.

Pittsburgh-based Dravo also furnished a complete water treatment plant which supplies water to cool the mold and casting machine components during operation, as well as water for an atomized water spray system to cool the surface of the steel bloom as it passes through the casting machine.

Mannesmann's U.S. Steel/Lorain strand caster is significantly smaller but no less state-of-the-art.

The continuous casting facility at Lorain is located on the east side of the BOP shop and receives the steel to be cast from this melting facility.

The BOP shop is equipped with ladle metallurgy facilities for the production of the highest quality clean steels.

The continuous casting plant consists of four main aisles or areas.

The first is the ladle bay where steel is received into the casting plant and empty ladles are handled. This bay also serves as a tundish repair area.

The second aisle is the casting bay and contains the casting floor and the top components of the casting machine, i.e. molds, mold oscillators, tundish cars, preheat stations and spray chamber. The south end of this aisle also contains the necessary space and equipment to prepare tundishes for casting. The ladle turret, which holds the ladle during casting, is located between the ladle bay and casting bay and its arms extend into each bay to permit crane service. This ladle turret is capable of handling two ladles.

The third aisle contains the components comprising the discharge end of the machine, i.e. withdrawal-straightener machines, dummy bar disconnecting system, cut-off torches, runout table, dummy bar storage, cross-transfer table and the entry end of the cooling bed. An in-line inspection facility is also located in this bay.

The fourth bay of this facility houses the discharge end of the cooling bed, final inspection and reject tables, finished product storage and shipping facilities. Adjacent to and south of the runout bay is the water treatment plant and office complex.

While conventional wisdom has it that there are no U.S. companies in the continuous caster building or designing business, that is simply not true. Concast and Rokop Corp., in Pittsburgh, are two examples.

British Steel uses a Rokop four-strand caster for billets. The machine casts heats from basic oxygen furnaces from 300 ton ladles on two banks of four strands to produce billets from 4 in. x 4 in. to 6 in. x 6 in. square at casting speeds of 4 m/min.

The caster provides a wide range of

steels for the wire drawing market including carbon and cold heading grades and the machine will have all the equipment necessary to facilitate the casting of billets to the tight specifications such products demand.

Rokop-Davy Ltd. was established as a joint venture by Rokop Corp. of Pittsburgh, U.S.A. and Davy McKee (minerals and metals) Ltd. of Stockton-on-Tees, England, to design and supply worldwide continuous casting machines.

And, in January, 1983 Rokop Corp. started up two other continuous casting machines, one in Australia for Smorgon Consolidated Industries, and one in Youngstown, Ohio for Hunt Steel.

The Hunt caster, the first of its kind for Rokop, produces 10.5 in. round blooms. The three-strand machine has a radius of 40 ft. and an annual production capacity of 300,000 tons/year from 85 ton heat sizes. A full shrouding from ladle to tundish, as well as from tundish to mold, protects the stream.

Smorgon Consolidated Industries started up a two-strand (expandable to three) Rokop billet caster with a 20 ft radius. Smorgon produces 4 in. by 4 in. billets from 60 ton heats. Annual capacity for Smorgon is 210,000 tons/year.

North Star Steel in Beaumont, Texas recently placed an order for Rokop to replace its present starting system on eight strands of its existing two casting machines to the Rokop solid starting bar technology. The casters were originally built by Concast in 1976 with its own chain type starting device.

Scorpion Types

In 1979 Concast replaced these chains with the so-called "scorpion type" starting system, which is technologically somewhere between the antiquated chain type starting system and the Rokop type solid starting bar technology.

Another new melt/cast facility will go into operation at National Metals Industry, Cairo, Egypt, in mid 1986.

The facility, designed with Rokop features, is a three-strand continuous caster to produce billets ranging in size from 4 in. x 4 in. to 6 in . x 6 in. Designed for sequence casting, the caster is supplied by two electric arc furnaces each producing 35 metric tons per heat. Annual production will be approximately 158,000 metric tons.

In addition to the continuous caster and furnaces, auxiliary equipment such as scrap buckets, ladles and cranes; plus, laboratory, maintenance, scrap handling and water treatment facilities are part of the turnkey contract.

All management and engineering will be done in Pittsburgh by the Rokop Corp. and Pennsylvania Engineering Corp. Equipment will be supplied by domestic manufacturers.

One of the more interesting new strand casters in the U.S., however, doesn't represent many of the big names in the business at all. It was, in effect, put together by the purchaser, Babcock & Wilcox.

The caster itself, for example, is from Mecan-Arbed, Luxembourg, and "is the only one built for a customer so far" outside its own steel plant, said Lowell S. Gonano, B&W tubular products group general superintendent of steel operations.

"We don't call it a ladle or caster shop. It's a steelmaking machine," Mr. Gonano adds. "We looked all over the world for the pieces."

Three things make up continuous casting success, he believes. "It's chemistry, deoxidation level and temperature control." According to Mr. Gonano, the company's new plant in Beaver Falls handles all three with computerized ease.

"Our furnace is computer controlled. Others say that, but ours actually works. The computer here really runs it."

The $80 million project increases B&W capacity at the plant by 30 pct and reduces energy costs by 40 pct.

The 80 ton furnace itself was designed by Krupp International, Inc. and is 19 ft in. diam. It's ultra-high powered (UHP) with a water-cooled roof and shell using a 60 MVA transformer. Officially, the furnace operates on a 90 minute cycle, but "in the future we'll be reporting heats under an hour," said Mr. Gonano.

The furnace has three 22-in. electrodes. A fourth hole is for fume extraction B&W reports and a fifth is for flux and carbon feeding.

The furnace uses the "foamy slag" type of melting and is equipped with three oxy-fuel burners. "Everybody's fooling around today with foamy slag. This furnace was designed to run with it," said Mr. Gonano. "It is one of the few efffective foam slag in the U.S.," he said.

According to Hugh Madden, manager of steel operations, the new furnace will function differently than its other furnaces. "In our existing shops, we melt and refine the steel in the furnace. In the new shop, the furnace will only melt the steel. It will then be tapped into a ladle, and from there taken directly to the ladle refining station," Mr. Madden said.

By not using the furnace for the refining process, it will be ready to melt again at a much greater rate.

The steel is tapped from the UHP furnace and from here it moves on to the ladle refining station. The bulk of the alloy additions will take place during reladling.

The ladle refining system (LRS) is a new technique for B&W. "It's unlike anything we've had before," added Mr. Madden. By combining the principles of our present vacuum degassing and argon stirring station with electric arc reheating capability, the ladle refining station will allow us to achieve the optimim chemistry, gas content and temperature control," Mr. Madden explained.

The LRS was designed by Stein-Huerty/Midland Ross and uses a 12 MVA transformer. Steel is continuously stirred during reheating, alloying and desulfurization via a side mounted tuyere in the ladle. Cycle time? About 40 minutes.

According to Mr. Gonano, the operating teams have more than mastered the timing between furnace, ladle and caster.

The Mecan-Arbed caster itself is a four-strand, curved mold machine capable of casting 9 in. x 9 in. square blooms and 5½ in. rounds.

Software was designed by Krupp International, Inc. and the main computer hardware comes from Hewlett-Packard.

Reprints available while supply lasts. For single copy, circle No. 84 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1053

PRICE & PRODUCTION DATA

(Effective July 2, 1984)

Steel production by districts, thousands of tons (000 omitted)	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	225	230	264	182
Pittsburgh	233	231	287	30
Youngstown	89	99	116	175
Lake Erie	128	127	160	134
Detroit	167	163	161	134
Chicago	460	487	550	454
Cincinnati	110	109	82	95
St. Louis	83	79	88	72
Southern	199	209	225	135
Western	91	90	94	85
U.S. Production	1,785	1,824	2,027	1,592

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective July 2, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,785	1,824	51,332	39,961
Capability Utilization Rate	68.7	70.2	76.2	53.1

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 5/14/84)	27.405	27.405	27.405	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 82.17	$ 85.17	$ 85.17	$ 71.50
No. 2 bundles	$ 52.17	$ 56.17	$ 56.83	$ 46.17

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 88.50	$ 94.50	$ 94.50	$ 74.50
No. 1 steel, Philadelphia	80.50	80.50	80.50	68.50
No. 1 steel, Chicago	77.50	80.50	80.50	71.50
No. 1 bundles, Detroit	75.50	82.50	87.50	71.50
Low Phos., Youngstown	80.50	89.50	90.50	75.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	100.50	98.50
No. 1 mach'y cast., Chi	115.50	117.50	117.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective July 2, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	56.92	57.21	7/2/84
Copper (C)	63.50-66.00	63.00-65.00	6/28/84
Lead	32.00	30.00-32.00	7/2/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	50.00-53.00	51.00-53.00	6/27/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$215.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$2.25
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$370.00
Indium, dollars per troy oz.	$3.30-$3.60
Iridium, dollars per troy oz.	$600
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$322-$330
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$475
Rhodium, per troy oz.	$600.00
Silver ingots, per troy oz.	$8.30
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

June 25—571.76
June 26—571.92
June 27—573.25
June 28—571.26
June 29—571.26

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	63½	60½
Yellow brass	59⅜	57½
Red brass	60⅜	58¼
Comm. bronze	60¾	58½
Mang. bronze	58	54¼
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	48
Light copper	39

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	54
No. 2 copper wire	44
Light copper	35
No. 1 composition	55
No. 1 comp. turnings	53
Hvy. yellow brass solids	38
Hvy. yellow brass turnings	36
Radiators	42

Aluminum

New mixed clips	44	—45
Old sheet	41	—42
Old cast	41	—42
Clean dry borings	42	—43

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	39	—40
Mixed L.C. clips	36	—37
Old sheets and cast	31	—32
Borings and turnings	25	—26
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	49	—50
No. 2 copper wire	41	—42
Light copper	37	—38
Radiators	35	—36
No. 1 composition	43	—44
No. 1 composition turn'gs	40	—41
Cocks and faucets	31	—32
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	44	—45

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	60	— 70

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE JULY 2, 1984

(Effective July 2, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 88.00 to $ 89.00
No. 2 hvy. melting	78.00 to 79.00
No. 1 dealer bundles	96.00 to 97.00
No. 1 factory bundles (auto)	96.00 to 97.00
No. 2 bundles	57.00 to 58.00
No. 1 busheling	97.00 to 98.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	49.00 to 50.00
Cast iron borings	48.00 to 49.00
Low phos. punchings plate	104.00 to 105.00
Heavy turnings	78.00 to 79.00
No. 1 RR hvy. melting	90.00 to 91.00
Rails 2 ft. and under	114.00 to 115.00
Scrap rails, random lgth.	103.00 to 104.00
RR specialties	105.00 to 106.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	580.00 to 590.00
18-8 turnings	480.00 to 490.00

Chicago

No. 1 hvy. melting	$ 77.00 to $ 78.00
No. 2 hvy. melting	71.00 to 72.00
No. 1 dealer bundles	91.00 to 92.00
No. 1 factory bundles (auto)	92.00 to 93.00
No. 2 dealer bundles	49.00 to 50.00
No. 1 busheling	91.00 to 92.00
Shredder scrap	89.00 to 90.00
Machine shop turn.	42.00 to 43.00
Mixed bor. and turn.	43.00 to 44.00
Shoveling turnings	49.00 to 50.00
Cast iron borings	49.00 to 50.00
Low phos. forge crop	115.00 to 116.00
Low phos. punchings plate ¼ in. and heavier	125.00 to 126.00
Low phos. 2 ft. and under	120.00 to 121.00
No. 1 RR hvy. melting	83.00 to 84.00
Scrap rails, random lgth.	87.00 to 88.00
Reroller rails	108.00 to 109.00
Rails, 2 ft. and under	115.00 to 116.00
RR couplers and knuckles	97.00 to 98.00
RR car axles	124.00 to 125.00
No. 1 machinery cast	115.00 to 116.00
Cupola cast	105.00 to 106.00
Stove plate	101.00 to 102.00
Steel car wheels	107.00 to 108.00
Stainless	
18-8 bundles and solids	540.00 to 550.00
18-8 turnings	440.00 to 450.00
430 bundles and solids	130.00 to 135.00
430 turnings	95.00 to 100.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to $ 82.00
No. 2 hvy. melting	69.00 to 72.00
No. 1 dealer bundles	90.00 to 93.00
No. 2 dealer bundles	48.00 to 51.00
No. 1 busheling	90.00 to 93.00
Shredder scrap	96.00 to 99.00
Machine shop turn.	29.00 to 32.00
Mixed bor. and turn.	29.00 to 32.00
Shoveling turnings	41.00 to 44.00
Low phos. 5 ft. and under	95.00 to 98.00
Low phos. 2 ft. punchings	115.00 to 118.00
Electric furnace bundles	101.00 to 104.00
RR specialties	100.00 to 103.00
Rails, 2 ft. and under	117.00 to 120.00
Cupola cast	70.00 to 73.00
Heavy breakable cast	57.00 to 60.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 55.00 to $ 56.00
No. 2 hvy. melting	54.00 to 55.00
No. 1 dealer bundles	75.00 to 76.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	74.00 to 75.00
Drop forge flashings	49.00 to 50.00
Machine shop turn.	45.00 to 46.00
Mixed borings and turn.	23.00 to 24.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	36.00 to 37.00
Heavy breakable cast	38.00 to 39.00
Mixed cupola cast	54.00 to 55.00
Automobile cast	77.00 to 78.00
Stainless	
18-8 bundles and solids	445.00 to 455.00
18-8 turnings	350.00 to 360.00
430 bundles and solids	100.00 to 110.00

Youngstown

No. 1 hvy. melting	$ 66.00 to $ 69.00
No. 2 hvy. melting	47.00 to 50.00
No. 1 dealer bundles	79.00 to 82.00
No. 2 dealer bundles	35.00 to 38.00
Machine shop turn.	13.00 to 16.00
Shoveling turnings	18.00 to 21.00
Low phos. plate	79.00 to 82.00
Electric furnace bundles	76.00 to 79.00
Galvanized bundles	67.00 to 70.00

Cleveland

No. 1 hvy. melting	$ 65.00 to $ 68.00
No. 2 hvy. melting	42.00 to 45.00
No. 1 dealer bundles	76.00 to 79.00
No. 1 factory bundles	80.00 to 83.00
No. 2 bundles	24.00 to 27.00
No. 1 busheling	78.00 to 81.00
Machine shop turn.	10.00 to 13.00
Mixed bor. and turn.	10.00 to 13.00
Shoveling turnings	12.00 to 15.00
Cast iron borings	15.00 to 18.00
Cut structural & plates, 2 ft. and under	110.00 to 113.00
Low phos. punchings plate	110.00 to 113.00
Drop forge flashings	56.00 to 59.00
Foundry steel, 2 ft. & under	65.00 to 68.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	117.00 to 120.00
Rails, 18 in. and under	118.00 to 121.00
Steel axle turnings	67.00 to 70.00
Railroad cast	100.00 to 103.00
No. 1 machinery cast	109.00 to 112.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 69.00 to $ 70.00
No. 2 hvy. melting	58.00 to 59.00
No. 1 busheling	79.00 to 80.00
No. 1 dealer bundles	79.00 to 80.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	22.00 to 23.00
Low phos. plate	98.00 to 99.00
Structural and plate, 2 ft. and under	99.00 to 100.00
Rails, 2 ft. and under	94.00 to 95.00
Scrap rails, random lgth.	74.00 to 75.00
No. 1 machinery cast	79.00 to 80.00
No. 1 cupola cast	59.00 to 60.00

St. Louis

No. 1 hvy. melting	$ 68.00 to $ 69.00
No. 2 hvy. melting	57.00 to 58.00
Foundry steel, 2 ft.	66.00 to 67.00
No. 1 dealer bundles	68.00 to 69.00
No. 2 bundles	65.00 to 66.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	27.00 to 28.00
No. 1 RR hvy. melting	68.00 to 69.00
Rails, random length	70.00 to 71.00
Rails, 18 in. and under	89.00 to 90.00
RR specialties	85.00 to 86.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	50.00 to 51.00
Stove plate	83.00 to 84.00
Steel car wheels	81.00 to 82.00
Rerolling rails	80.00 to 81.00
Unstripped motor blocks	56.00 to 57.00

Birmingham

No. 1 heavy melting	$ 75.00 to $ 76.00
No. 2 heavy melting	70.00 to 71.00
No. 1 dealer bundles	75.00 to 76.00
No. 2 bundles	54.00 to 55.00
No. 1 busheling	75.00 to 76.00
Shredder scrap	93.00 to 94.00
Machine shop. turn.	33.00 to 34.00
Shoveling turnings	44.00 to 45.00
Cast iron borings	44.00 to 45.00
Electric furnace bundles	66.00 to 67.00
Elec. furnace, 3 ft. & under	71.00 to 72.00
Structural and plate, 2 ft.	97.00 to 98.00
Structural and plate, 4 ft.	87.00 to 88.00
No. 1 RR hvy. melting	87.00 to 88.00
Scrap rails, random lgth.	82.00 to 83.00
Rails, 2 ft. and under	102.00 to 103.00
Angles and splice bars	87.00 to 88.00
No. 1 cupola cast	85.00 to 86.00
Unstripped motor blocks	67.00 to 68.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to $ 66.00
No. 2 hvy. melting	59.00 to 60.00
No. 1 dealer bundles	77.00 to 78.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	7.00 to 8.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. and under	94.00 to 95.00
Rails, random length	76.00 to 77.00
Rails, 2 ft. and under	91.00 to 92.00
No. 1 cupola cast	64.00 to 65.00
Heavy breakable cast	31.00 to 32.00
Drop broken cast	85.00 to 86.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 52.00
No. 2 hvy. melting	41.00 to 43.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	50.00 to 51.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	505.00 to 525.00
18-8 turnings	400.00 to 420.00
430 prepared solids	90.00 to 110.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to $ 66.00
No. 2 hvy. melting	55.00 to 56.00
No. 1 dealer bundles	70.00 to 71.00
No. 2 bundles	39.00 to 41.00
No. 1 busheling	75.00 to 76.00
Shredder scrap	73.00 to 75.00
Machine shop turn.	14.00 to 16.00
Shoveling turnings	20.00 to 22.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	48.00 to 50.00
Heavy breakable cast	18.00 to 20.00

San Francisco

No. 1 hvy. melting	$ 45.00 to $ 47.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	35.00 to 37.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to $ 48.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	36.00 to 38.00
No. 2 dealer bundles	17.00 to 19.00
Machine shop turn.	10.00 to 12.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to 79.00
No. 1 cupola cast	77.00 to 79.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	42.00 to 44.00
No. 1 cupola cast	98.00 to 100.00
Mixed yard cast	85.00 to 87.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 86.00
No. 2 heavy melting cut 2 ft. and under	78.00
No. 1 dealer bundles	87.00
No. 2 bundles	48.00
Mixed steel scrap	54.00
Bush. new fact. prep'd.	85.00
Bush. new fact. unprp'd.	75.00
Machine shop turn.	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to $ 74.00
No. 2 hvy. melting	59.00 to 60.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	16.00 to 17.00
Crushed turnings	36.00 to 37.00
Shredder scrap	78.00 to 79.00
Cut structural plate, 2 ft. and under	100.00 to 102.00
Cut structural plate, 5 ft. and under	89.00 to 91.00
Unstripped motor blocks	60.00 to 61.00
Cupola cast	75.00 to 76.00

DURABLE ORDERS KEEP CLIMBING

The economy experienced a healthy uptick in May. New orders for durable goods in May rose 3.8 pct to $102 billion compared with April's $98.3 billion, Commerce noted.

By the same token, the constantly fluctuating defense orders fell 8.8 pct to $5.7 billion. They also fell in April.

Capital goods new orders without the defense quotient rose 10.4 pct to $28.6 billion compared with April's $25.9 billion. The April figure had fallen compared with March.

Primary metals orders suffered in May—all down compared with April—the total dropping 12.3 pct to $10.6 billion vs. $11.9 billion the previous month. This marked the fifth decline in the last six months. It was also the largest one-month decline since a 14.1 pct drop in March 1983.

Within that category, nonferrous metals orders suffered the greatest drop—16 pct—down to $5 billion compared with $5.8 billion in April. Steel orders were down 9 pct—$4.4 billion to $4.8 billion—and iron and steel castings orders dropped 8 pct.

However, all was health in metalworking. Machine tools new orders were up a whopping 26.5 pct to $320.1 million compared with $253.1 million in April. Within that category, metalcutting tools new orders rose 6.8 pct and metalforming tools new orders rose almost 75 pct. Dollar orders in the latter category were $128.1 million; in the former the figure for May was $192.0 million.

The increases in new orders came as no surprise to observers who have been following the trend lines this year. The increases had been expected in light of a recent report showing that orders for durable goods—products expected to last three or more years—had risen sharply from an April setback.

The improvement in new orders was founded principally in the machinery category which had shown a 10.2 pct decline in April.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	1st Qtr.	$332.7	$318.8	$293.0
Manufacturing, Total	1st Qtr.	124.7	116.4	109.9
Manufacturing, Durable Goods	1st Qtr.	59.2	54.9	50.7
Mining Industry	1st Qtr.	13.6	12.4	12.0
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	May	102.0	98.3	84.5
Shipments	May	97.9	95.7	83.0
Inventories	May	180.4	178.0	170.7
Unfilled Orders	May	344.4	340.3	300.8
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	May	28.6	25.9	22.1
Capital Goods Producers, Defense Industries	May	5.7	6.2	4.7
Primary Metals, Total	May	10.6	11.9	10.0
Steel (SIC 331)	May	4.4	4.8	4.2
Iron & Steel Castings (SIC 332)	May	1.2	1.3	1.1
Nonferrous Metals	May	5.0	5.8	4.7
Nonelectrical Mach.-Equip. Industries, Total	May	18.9	16.9	15.1
Engines & Turbines	May	1.0	1.2	1.1
Farm Machinery & Equipment (Shipments)	May	0.9	0.9	1.0
Construction, Mining & Mat. Hdlg. Equip.	May	3.0	2.6	2.6
General Industrial Machinery	May	1.4	1.4	1.0
Fluid Power Equipment** (Index-1972=100)	May	303.0	310.0	218.0
Metalworking Machinery	May	0.9	0.8	0.7
Machine Tools, Total ($ Mill., Unadjusted)***	May	320.1	253.1	135.3
Machine Tools, Metalcutting***	May	192.0	179.8	93.6
Machine Tools, Metalforming***	May	128.1	73.3	41.7
Electrical Mach. & Equip. Industries, Total	May	17.5	14.7	13.6
Elec. Transmission Equip. & Ind. Apparatus	May	1.9	2.0	1.5
Household Appliances	May	1.6	1.3	1.3
Communication Equipment	May	5.6	4.0	4.3
Transportation Equip. Industrial, Total	May	23.5	24.5	18.5
Motor Vehicles & Parts (Shipments)	May	15.6	15.2	12.3
Aircraft, Missiles & Parts	May	6.1	8.0	4.2
Shipbuilding & Military Tanks	May	1.1	0.4	1.1
Fabricated Metal Products, Total	May	11.5	10.9	10.0
Instruments, Total	May	5.1	4.8	4.0

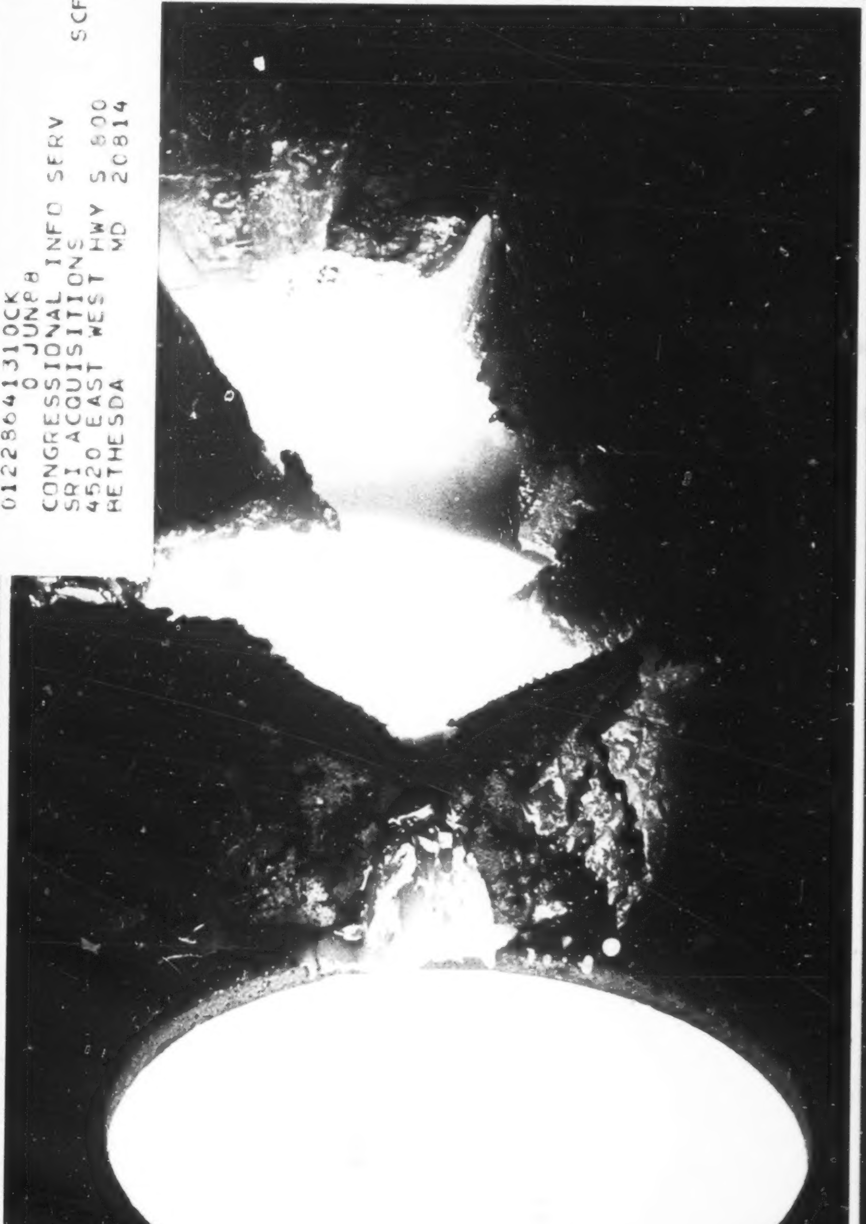
*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA

CHILTON'S

IRONAGE

August 6, 1984

01228641310CK
0 JUN88
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS SCF
4520 EAST WEST HWY S 800
BETHESDA MD 20814



HOW VACUUM MELTING IS MAKING THE BEST ALLOYS BETTER

U.S. Steel-Bethlehem: A Partnership in Strip Casting

In Plant Spotlight: Continental's $18 Million Bargain

Quality, What It Takes: Cabot's New Plant is a Miracle of Timing

AUGUST 6, 1984 VOL. 227, NO. 15

CHILTON'S

IRONAGE
METALS PRODUCER

Editorial 7
Someone, somewhere, some deal!

Newswatch 13
Opposition to the ITC's steel ruling is growing.

The Hot Spot 22
Think big, go for the quantum leap!

Vacuum Melting 24
It was superalloys; now it's "super-duper" alloys.

In-Plant Spotlight 42
Modernized rod mill makes Continental competitive.

Quality: What It Takes 45
Cabot is ready to roll out a new strip mill.

Strip Casting 48
USS/Bethlehem program might gain ground globally.

Materials Report 54
Steel producers have second thoughts about trade remedies.

Price Trends 68
Producer prices stable for the third consecutive month.

Next issue: Process Controls: Monitoring Quality in Steel.

Departments

EDITORIAL STAFF **11**
SIGNED, SEALED AND DELIVERED **11**
INDUSTRIAL BRIEFS **21**
PRODUCT & EQUIPMENT REVIEW **50**
P&P DATA 7/23 **56**
FERROUS SCRAP 7/23 **57**
AD INDEX **58**
MANAGEMENT SERVICE CARD **59**
BUSINESS STAFF **60**
STEEL PRICES **61**
CLEARING HOUSE **66**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

Chilton
abc
ONE OF THE ABC PUBLISHING COMPANIES

PRICE & PRODUCTION DATA

(Effective July 23, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	218	215	230	171
Pittsburgh	247	213	231	194
Youngstown	88	82	99	96
Lake Erie	120	122	127	114
Detroit	189	156	163	132
Chicago	466	463	487	459
Cincinnati	89	100	109	95
St. Louis	60	59	79	69
Southern	188	188	209	125
Western	79	78	90	87
U.S. Production	1,744	1,676	1,824	1,572

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.

86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective July 23, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,744	1,676	56,439	44,724
Capability Utilization Rate	67.6	64.9	75.2	53.3

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.405	26.217
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 82.17	$ 82.17	$ 85.17	$ 72.50
No. 2 bundles	$ 50.83	$ 50.83	$ 56.17	$ 45.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 88.50	$ 88.50	$ 94.50	$ 74.50
No. 1 steel, Philadelphia	80.50	80.50	80.50	68.50
No. 1 steel, Chicago	77.50	77.50	80.50	74.50
No. 1 bundles, Detroit	75.50	75.50	82.50	71.50
Low Phos., Youngstown	80.50	80.50	89.50	77.50
No. 1 mach'y cast., Pgh	75.50	75.50	79.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi	115.50	115.50	117.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective July 23, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	52.50	52.11	7/23/84
Copper (C)	63.00-65.00	64.00-66.00	7/17/84
Lead	30.00-34.00	32.00-34.00	7/10/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	50.00	50.00-53.00	7/3/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55-$2.25
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$335.00
Indium, dollars per troy oz.	$3.30-$3.60
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$310-$320
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel oxide sinter at U.S. points of entry	$3.12
Palladium, per troy oz.	$140
Platinum, per troy oz.	$345
Rhodium, per troy oz.	$700
Silver ingots, per troy oz	$7.15
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

July 16—565.78
July 17—563.67
July 18—563.01
July 19—563.67
July 20—562.74

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	59½	56½
Yellow brass	56⅝	53¼
Red brass	57	54¼
Comm. bronze	57⅛	54½
Mang. bronze	56	50
Free cutting rod ends	59	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	48
Light copper	39

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	52
No. 2 copper wire	44
Light copper	35
No. 1 composition	55
No. 1 comp. turnings	53
Hvy. yellow brass solids	37
Hvy. yellow brass turnings	35
Radiators	41

Aluminum

New mixed clips	42	—43
Old sheet	39	—40
Old cast	39	—40
Clean dry borings	40	—41

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	37	—38
Mixed L.C. clips	34	—35
Old sheets and cast	30	—31
Borings and turnings	23	—24
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	47	—48
No. 2 copper wire	39	—40
Light copper	35	—36
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	39	—40
Cocks and faucets	30	—31
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	43	—44

Lead

Heavy soft lead	10	—11
Whole batteries	3	— 4
Type metal	16	—17
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE JULY 23, 1984

(Effective July 23, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 88.00 to	$ 89.00
No. 2 hvy. melting	78.00 to	79.00
No. 1 dealer bundles	96.00 to	97.00
No. 1 factory bundles (auto)	96.00 to	97.00
No. 2 bundles	53.00 to	54.00
No. 1 busheling	97.00 to	98.00
Machine shop turn	12.00 to	13.00
Shoveling turnings	49.00 to	50.00
Cast iron borings	48.00 to	49.00
Low phos. punchings plate	104.00 to	105.00
Heavy turnings	78.00 to	79.00
No. 1 RR hvy. melting	90.00 to	91.00
Rails 2 ft. and under	114.00 to	115.00
Scrap rails, random lgth.	103.00 to	104.00
RR specialties	105.00 to	106.00
No. 1 machinery cast	75.00 to	76.00
Cupola cast	68.00 to	69.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	580.00 to	590.00
18-8 turnings	480.00 to	490.00

Chicago

No. 1 hvy. melting	$ 77.00 to	$ 78.00
No. 2 hvy. melting	71.00 to	72.00
No. 1 dealer bundles	91.00 to	92.00
No. 1 factory bundles (auto)	92.00 to	93.00
No. 2 dealer bundles	49.00 to	50.00
No. 1 busheling	91.00 to	92.00
Shredder scrap	89.00 to	90.00
Machine shop turn	42.00 to	43.00
Mixed bor. and turn.	43.00 to	44.00
Shoveling turnings	49.00 to	50.00
Cast iron borings	49.00 to	50.00
Low phos. forge crop	111.00 to	112.00
Low phos. punchings plate ¼ in. and heavier	121.00 to	122.00
Low phos. 2 ft. and under	116.00 to	117.00
No. 1 RR hvy. melting	83.00 to	84.00
Scrap rails, random lgth.	87.00 to	88.00
Reroller rails	108.00 to	109.00
Rails, 2 ft. and under	115.00 to	116.00
RR couplers and knuckles	97.00 to	98.00
RR car axles	129.00 to	130.00
No. 1 machinery cast	115.00 to	116.00
Cupola cast	102.00 to	103.00
Stove plate	99.00 to	100.00
Steel car wheels	103.00 to	104.00
Stainless		
18-8 bundles and solids	490.00 to	500.00
18-8 turnings	420.00 to	430.00
430 bundles and solids	120.00 to	125.00
430 turnings	80.00 to	90.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to	$ 82.00
No. 2 hvy. melting	69.00 to	72.00
No. 1 dealer bundles	93.00 to	96.00
No. 2 dealer bundles	48.00 to	51.00
No. 1 busheling	92.00 to	95.00
Shredder scrap	96.00 to	99.00
Machine shop turn	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	41.00 to	44.00
Low phos. 5 ft. and under	95.00 to	98.00
Low phos. 2 ft. punchings	115.00 to	118.00
Electric furnace bundles	101.00 to	104.00
RR specialties	100.00 to	103.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	70.00 to	73.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 55.00 to	$ 56.00
No. 2 hvy. melting	54.00 to	55.00
No. 1 dealer bundles	75.00 to	76.00
No. 2 bundles	37.00 to	38.00
No. 1 busheling	74.00 to	75.00
Drop forge flashings	49.00 to	50.00
Machine shop turn	45.00 to	46.00
Mixed borings and turn.	23.00 to	24.00
Shoveling turnings	46.00 to	47.00
Cast iron borings	36.00 to	37.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	445.00 to	455.00
18-8 turnings	350.00 to	360.00
430 bundles and solids	100.00 to	110.00

Youngstown

No. 1 hvy. melting	$ 66.00 to	$ 69.00
No. 2 hvy. melting	47.00 to	50.00
No. 1 dealer bundles	79.00 to	82.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turn	13.00 to	16.00
Shoveling turnings	18.00 to	21.00
Low phos. plate	79.00 to	82.00
Electric furnace bundles	76.00 to	79.00
Galvanized bundles	67.00 to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00 to	$ 63.00
No. 2 hvy. melting	37.00 to	40.00
No. 1 dealer bundles	71.00 to	74.00
No. 1 factory bundles	75.00 to	78.00
No. 2 bundles	19.00 to	22.00
No. 1 busheling	73.00 to	76.00
Machine shop turn	8.00 to	11.00
Mixed bor. and turn.	8.00 to	11.00
Shoveling turnings	10.00 to	13.00
Cast iron borings	13.00 to	16.00
Cut structural & plates, 2 ft. and under	105.00 to	108.00
Low phos. punchings plate	105.00 to	108.00
Drop forge flashings	47.00 to	50.00
Foundry steel, 2 ft. & under	65.00 to	68.00
No. 1 RR hvy melting	82.00 to	85.00
Rails, 2 ft. and under	112.00 to	115.00
Rails, 18 in. and under	113.00 to	116.00
Steel axle turnings	67.00 to	70.00
Railroad cast	100.00 to	103.00
No. 1 machinery cast	109.00 to	112.00
Cupola cast	63.00 to	66.00
Stove plate	48.00 to	51.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	56.00 to	57.00
No. 1 busheling	79.00 to	80.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 bundles	37.00 to	38.00
Machine shop turn	14.00 to	15.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	22.00 to	23.00
Low phos. plate	95.00 to	96.00
Structural and plate, 2 ft. and under	96.00 to	97.00
Rails, 2 ft. and under	94.00 to	95.00
Scrap rails, random lgth.	74.00 to	75.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 68.00 to	$ 69.00
No. 2 hvy. melting	57.00 to	58.00
Foundry steel, 2 ft.	66.00 to	67.00
No. 1 dealer bundles	68.00 to	69.00
No. 2 bundles	54.00 to	55.00
Machine shop turn	17.00 to	18.00
Shoveling turnings	23.00 to	24.00
Cast iron borings	27.00 to	28.00
No. 1 RR hvy. melting	68.00 to	69.00
Rails, random length	70.00 to	71.00
Rails, 18 in. and under	89.00 to	90.00
RR specialties	85.00 to	86.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	50.00 to	51.00
Stove plate	83.00 to	84.00
Steel car wheels	81.00 to	82.00
Rerolling rails	80.00 to	81.00
Unstripped motor blocks	56.00 to	57.00

Birmingham

No. 1 heavy melting	$ 75.00 to	$ 76.00
No. 2 heavy melting	67.00 to	68.00
No. 1 dealer bundles	75.00 to	76.00
No. 2 bundles	54.00 to	55.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	93.00 to	94.00
Machine shop. turn	33.00 to	34.00
Shoveling turnings	44.00 to	45.00
Cast iron borings	44.00 to	45.00
Electric furnace bundles	66.00 to	67.00
Elec. furnace, 3 ft. & under	71.00 to	72.00
Structural and plate, 2 ft.	97.00 to	98.00
Structural and plate, 4 ft.	87.00 to	88.00
No. 1 RR hvy. melting	87.00 to	88.00
Scrap rails, random lgth.	82.00 to	83.00
Rails, 2 ft. and under	102.00 to	103.00
Angles and splice bars	87.00 to	88.00
No. 1 cupola cast	85.00 to	86.00
Unstripped motor blocks	67.00 to	68.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 62.00 to	$ 63.00
No. 2 hvy. melting	56.00 to	57.00
No. 1 dealer bundles	74.00 to	75.00
No. 2 bundles	34.00 to	35.00
Machine shop turn	6.00 to	7.00
Shoveling turnings	8.00 to	9.00
Cast iron borings	21.00 to	22.00
Low phos. 18 in. and under	90.00 to	91.00
Rails, random length	72.00 to	73.00
Rails, 2 ft. and under	88.00 to	89.00
No. 1 cupola cast	61.00 to	62.00
Heavy breakable cast	28.00 to	29.00
Drop broken cast	82.00 to	83.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	73.00 to	75.00
Machine shop turn	14.00 to	16.00
Shoveling turnings	20.00 to	22.00
No. 1 machinery cast	90.00 to	95.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	18.00 to	20.00

San Francisco

No. 1 hvy. melting	$ 43.00 to	$ 45.00
No. 2 hvy. melting	37.00 to	39.00
No. 1 dealer bundles	33.00 to	35.00
No. 2 dealer bundles	16.00 to	18.00
Machine shop turn	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	81.00 to	83.00

Los Angeles

No. 1 hvy. melting	$ 44.00 to	$ 46.00
No. 2 hvy. melting	37.00 to	39.00
No. 1 dealer bundles	34.00 to	36.00
No. 2 dealer bundles	16.00 to	18.00
Machine shop turn	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 70.00 to	$ 72.00
No. 2 hvy. melting	59.00 to	61.00
No. 2 bundles	41.00 to	43.00
No. 1 cupola cast	97.00 to	99.00
Mixed yard cast	84.00 to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	84.00
No. 1 dealer bundles	92.00
No. 2 bundles	48.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	92.00
Bush. new fact. unprp'd.	82.00
Machine shop turn	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to	$ 74.00
No. 2 hvy. melting	59.00 to	60.00
No. 2 bundles	42.00 to	43.00
Machine shop turn	16.00 to	17.00
Crushed turnings	36.00 to	37.00
Shredder scrap	78.00 to	79.00
Cut structural plate, 2 ft. and under	100.00 to	102.00
Cut structural plate, 5 ft. and under	89.00 to	91.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	75.00 to	76.00

PRODUCER KEY
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	26.26	33.90	33.70	31.00	25.83	22.67	19.31	31.54	34.34	50.60	69.58	73.19
Baltimore	26.28	30.72	37.59	36.83	33.68	28.80	22.05	37.10	57.45	64.70	71.71	77.05
Birmingham	24.03	31.90	32.34	30.92	25.55	23.01	19.58	29.68	49.31	58.90	68.10	74.43
Boston	32.76	37.74	42.52	45.84	35.34	30.06	22.24	38.66	47.33	51.92	59.88	65.00
Buffalo	29.86	34.53	41.01	38.75	33.76	27.29	19.47	35.74	42.73	48.21	54.88	61.76
Chicago	28.94	34.49	37.97	34.66	25.87	23.72	17.70	32.28	36.87	41.47	48.10	53.18
Cincinnati	27.68	33.79	36.41	30.60	24.04	23.97	17.90	32.47	36.40	40.83	46.27	51.76
Cleveland	27.83	33.73	37.18	36.74	27.26	27.25	18.81	36.34	40.46	44.35	48.47	55.33
Denver	33.68	38.11	40.59	36.10	34.69	26.21	21.10	44.31	50.89	59.53	67.39	75.21
Detroit	28.26	34.80	37.86	31.69	26.63	27.74	15.96	32.63	36.47	40.91	46.42	54.09
Houston	30.43	32.95	38.93	40.82	29.00	27.96	24.02	41.29	49.03	57.20	64.25	71.38
Kansas City	30.80	36.08	40.00	37.77	28.03	28.27	19.72	33.98	42.59	45.72	52.90	60.26
Los Angeles	28.51	34.50	38.37	41.32	34.21	33.35	24.34	40.22	52.74	60.63	67.36	74.03
Memphis	25.34	33.05	34.52	33.57	27.06	28.48	22.33	34.94	36.78	49.96	59.80	69.44
Milwaukee	29.35	34.89	37.85	32.28	25.03	23.90	17.58	32.83	37.09	41.82	46.73	53.60
New York	30.89	37.51	42.55	40.22	34.62	27.21	21.06	41.14	46.66	50.94	61.12	67.29
Philadelphia	29.76	34.88	40.92	44.88	33.39	28.75	20.85	39.37	46.84	53.80	65.77	72.08
Pittsburgh	33.67	39.53	43.78	34.29	37.60	29.92	21.29	30.60	43.01	49.15	55.93	63.28
Portland	28.96	32.08	38.73	36.93	32.88	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	28.41	33.00	38.86	40.69	36.05	31.65	25.96	41.80	53.25	61.50	71.06	76.09
Seattle	24.08	32.19	36.23	34.23	24.23	27.32	25.75	39.45	52.66	65.10	73.74	78.35
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	37.31	34.14	26.19	23.48	18.40	33.76	37.79	42.74	49.38	53.69
St. Paul	28.18	32.65	35.91	37.89	26.91	24.27	17.70	33.96	36.81	41.49	46.89	52.95

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2$^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 61. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(2), C10, U1	$473.00
R3	$453.00
Midwest	
R3, W5	$453.00
S1, U1, I3	$473.00
C10	$473.00
K2	$453.00
West	
B3(2)	$463.00
C6	$453.00
South	
A7	$453.00
Alloy, East	
R3,	$492.00
B3, U1, C10	$512.00
Midwest	
W5	$492.00
U1, C10, I3	$512.00
R3	$492.00
S1	$512.00
West	
B3	$502.00
C6	$469.00
South	
A7	$492.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3	22.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
A7	24.40
B3	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	22.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
A7, D1	22.05
I4	22.85
J3, D1, W3	22.05
G2, G3	23.45
N4	22.55
W5, S1	23.75
U1, B3, I3	23.75
M2, R3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, R3, W3, J3, I3, A7	22.05
G2, G3	23.45
S1	23.75
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	26.10
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	44.80

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
A7, M2, R3, W3	22.05
D1, J3	22.05
G2, G3	23.45
I4	22.45
U1, W5, S1, B3, I3	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
R3, M2, W3	26.15
G2, G3, M11	27.85
I4	22.00
J3, A7	26.15
D1	26.15
U1, W5, S1, B3, I3	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1, W3	28.00
A7, R3, Y1	28.00
G2, M11	30.00
U1, W5, S1, I3	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1, I3	29.65
A7, J3	27.65
Long-Terne, Midwest	
W5	31.65
U1	31.65
R3, A7	29.35

Wire Rod

East	
B3(2)	22.35
Midwest	
N4, K2	22.35
U1	24.10
West	
A7	22.00
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	per base box
J3	$26.29
U1	27.74
B3	27.54
Midwest	
U1	$27.74
J3	26.29
M11	27.24
W3	26.29
W5	27.74
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.87
J3	21.49
U1	22.37
W3	21.49
W5	22.37
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$24.31
Midwest	
J3, W5	$24.01
I3, W5	24.57
W3	24.01
U1, M11	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$20.49
Midwest	
M11	$19.70
W5	19.70
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
J3	25.80
U1, C10, B3(3)	27.05
Midwest	
A7, I4	23.95
U1, I3	27.05
R3, T10, C20, N4	25.80
K2	25.80
I3	22.00*
West	
B3	25.80
C6	24.45
South	
A8	20.65
A7	25.80
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
C10	31.00
Midwest	
W10, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
W14	22.20
B5	34.75
West	
R3	37.15
South	
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
R5, K3	27.95
R3, J3	27.95
U1, B3(2), C10	29.20
Midwest	
A7, R3	27.95
I3, C10, U1	29.20
I4	26.10
I3	23.50*
West	
B3	27.95
C6	26.60
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1	37.90
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
Midwest	
R3	37.35
J3, W10, C10	34.85
B1	37.30
N9	34.85
L2	34.65
B5	38.60
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3	23.25
L4, U1	25.75
P2	25.75
J3	26.75
Midwest	
B3	23.25
I3	25.75
J3, A7	22.80
U1, I4, S1	25.75
R3	26.75
West	
A7, C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
A7	25.75
U1	25.75
Alloy, East	
B3	31.05
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	31.05
G2, G3	33.55
I4, U1	33.55
West	
B3	33.55
O2	31.00
South	
A7	27.55
U1	33.55

Wire

Carbon Steel Wire, East	
B3	27.10
A11	22.15
Midwest	
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

PRODUCER PRICES STEADY IN JUNE

Economic analysts are calling the June producer price data "rock hard evidence of stability in the economy."

Overall producer prices were unchanged in June for the third consecutive month.

Excluding food prices, the producer price index was unchanged in June compared with May, the Labor Department said. The index for capital equipment, which makes up about 22.2 pct of the index, was also unchanged.

Decreases in prices of motor vehicles, photographic equipment and commercial furniture balanced advances for aircraft, pumps and compressors, printing machinery, integrating and measuring instruments, oil and gasfield machinery and fans and blowers.

The rate of increase for the producer price index for January through June when figured yearly is 2.8 pct, well below the 5-6 pct range frequently forecast for this year. Combining April, May and June shows a slight 0.3 pct drop in prices for the second quarter of 1984, the government said. It is the first such three-month drop since the beginning period of 1983. The index measures prices business pays for nearly 3,400 commodities purchased in bulk. The absence of inflation at that level in the second quarter is helping keep prices consumers pay from moving at too great a rate.

Government analysts speculate that excess capacity abroad, combined with increased import competition stimulated by the strong dollar, probably will allow the U.S. economy to expand—without inflation—to higher levels of capacity use than has been evident in recent years.

Prices received by producers of intermediate materials, supplies and components moved up 0.4 pct in June, following increases of 0.1 and 0.3 pct in April and May. The index for durable manufacturing materials turned around from a 0.5 pct drop in May to a 0.7 pct advance in June.

Latest Month Covered: June 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	383.3	+ 0.1	+ 1.6
Metal Forming Machine Tools	424.1	+ 0.2	+ 2.1
Agricultural Machinery & Equip.	336.8	− 0.1	+ 3.2
Construction Machinery & Equip.	358.1	+ 0.1	+ 1.6
Industrial Process Furnace & Ovens	374.3	0	+ 3.6
Industrial Material Handling Equip.	288.7	+ 0.3	+ 1.3
Pumps, Compressors & Allied Equip.	349.4	+ 0.3	+ 0.5
Fluid Power Equip. (Dec. 1970 = 100)	258.7	+ 0.6	+ 2.1
Mechanical Power Transmission Equip.	323.8	0	+ 2.6
Automobiles	220.9	− 0.2	+ 1.7
Motor Trucks—Light	282.3	0	+ 4.6
Motor Trucks—Heavy	334.7	0	+ 7.0
Railroad Equipment	361.2	0	+ 3.2
Fabricated Metal Structural Products	311.1	+ 0.2	+ 3.0
Electric Motors	340.2	+ 0.1	+ 5.1
Valves & Fittings (Dec. 1982 = 100)	102.0	0	+ 1.9
Ball & Roller Bearings	337.9	− 0.9	+ 2.2
Cutting Tools & Accessories	277.9	0	+ 0.6
Heating Equipment	251.3	− 0.5	+ 3.4
Plumbing Fixtures & Brass Fittings	302.0	+ 0.1	+ 3.9
Metal Containers	348.2	0	+ 3.2
Miscellaneous Metal Products	294.5	+ 0.5	+ 3.9

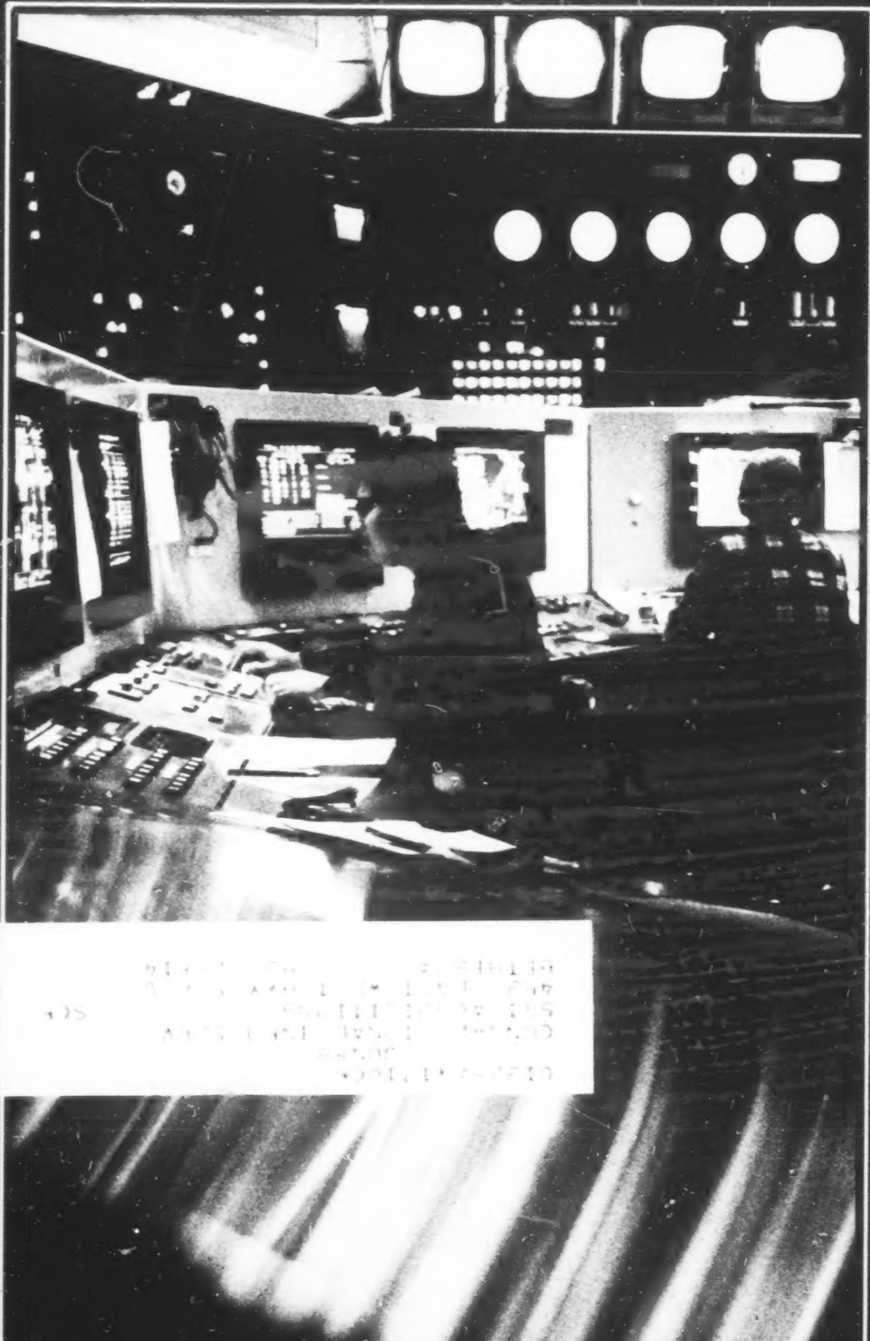
Data based on U.S. Labor Dept.'s Producer Price Index

CHILTON'S

August 20, 1984

IRON AGE

METALS PRODUCER



PUTTING TIGHT CONTROL ON STEELMAKING

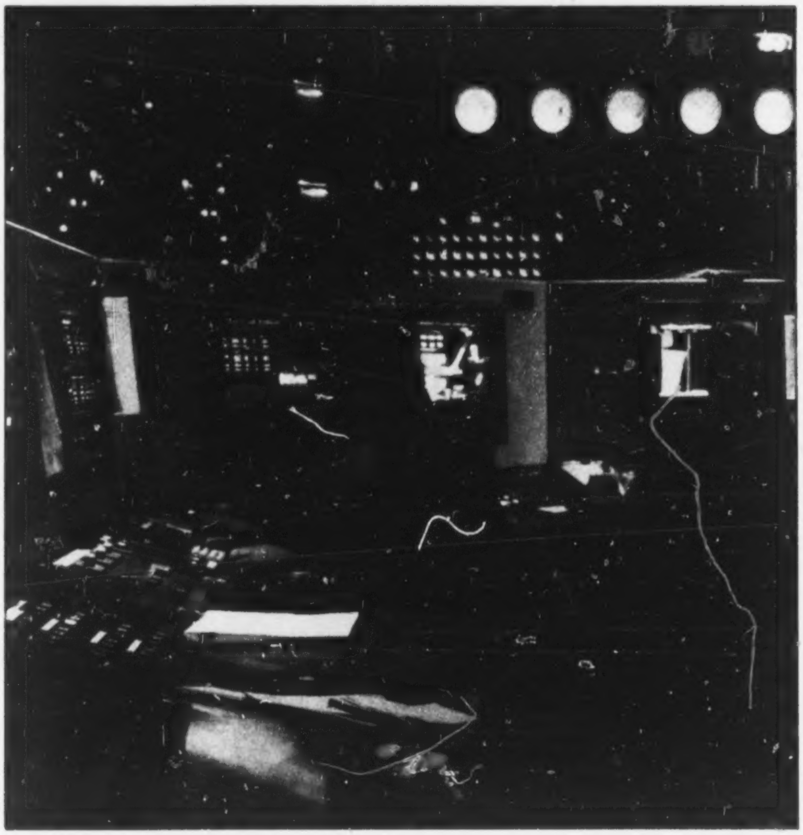
In Plant Spotlight: Getting More Out of Continuous Casting in Europe

Hot Spot: The Flap Over Steel Trade Restrictions

Technically Speaking: What Four Japanese Companies Are Doing in R&D

AUGUST 20, 1984 VOL. 227, NO. 16

CHILTON'S IRON AGE
MANUFACTURING MANAGEMENT



Cover courtesy of Inland Steel

Editorial 5
It's time to change the act.

Newswatch 19
National leaves the steel industry labor bargaining group.

The Hot Spot 28
Quota protection will cost steel users.

Process Controls 31
Steel companies push harder for tighter controls.

In-Plant Spotlight 49
Two bloom casters improve yield.

Metal Earnings 53
Second quarter: Steel profits off; nonferrous loses its grip.

Quality: What It Takes 57
How gaging is helping steel measure its quality.

Technically Speaking 59
Duplex stainless headed for the North Sea.

Materials Report 69
Steel producers blame inventory cutting for market lag.

Order Trends 84
Statistical indicators see-saw isn't cause for alarm yet.

Next Issue: Making Strip by Powder Metallurgy.

Departments

EDITORIAL STAFF 7
SIGNED, SEALED AND DELIVERED 8
PRODUCT & EQUIPMENT REVIEW 63
MANAGEMENT SERVICE CARD 75
BUSINESS STAFF 76
AD INDEX 77
P&P DATA 8/6 79
FERROUS SCRAP 8/6 81
CLEARING HOUSE 82

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

Chilton abc
ONE OF THE ABC PUBLISHING COMPANIES

PUTTING TIGHT CONTROL ON STEELMAKING

With quality and cost pressures mounting, steel companies are pushing hard for better controls. The need for tight control is tending to lead to more automatic systems.

BY GEORGE MCMANUS

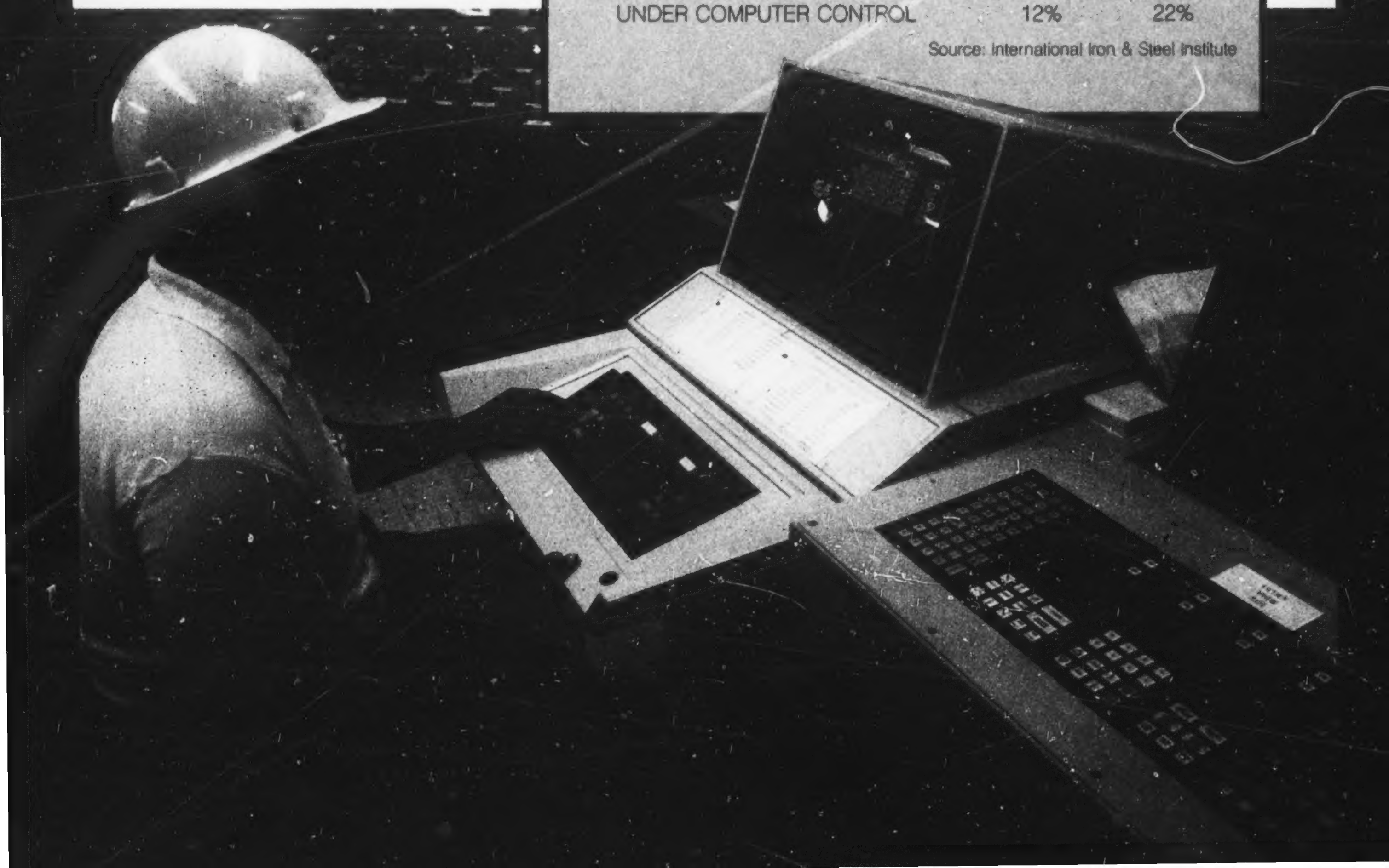
“The most economical place to operate is usually on the edge of a cliff,” said Richard K. Pitler, senior vice president and technical director, Allegheny Ludlum Steel Corp.

Dr. Pitler was saying that steel costs

COMPUTER PROCESS CONTROL GROWTH FACTORS IN SELECTED STEEL PLANT AREAS

	1981	1985
TOTAL HOT STRIP MILLS	**46**	**49**
MILLS WITH COMPUTERS	83%	86%
FURNACES WITH COMPUTERS	46%	78%
TOTAL SLABBING MILLS	**75**	**74**
MILLS WITH COMPUTERS	53%	65%
SOAKING PITS WITH COMPUTERS	44%	60%
TOTAL BLAST FURNACES	**136**	**130**
UNDER COMPUTER CONTROL	53%	71%
STOVE SYSTEMS	35%	59%
TOTAL COKE BATTERIES	**150**	**144**
UNDER COMPUTER CONTROL	12%	22%

Source: International Iron & Steel Institute



Shown here is the entry end and finishing end pulpits at the No. 3 continuous annealing line at Inland Steel.

are lowest when processes are run very close to the specified limits.

A mill can't afford to go over the cliff by exceeding the limits, he said; but neither can a mill afford to compensate for loose control by providing extra thickness or surplus alloy content.

This helps explain why steel producers are looking for more precise instruments and controls. "The degree of control determines how close you can get to the edge," said Dr. Pitler.

This thinking entered into the installation of a scale on a hot metal crane at the Brackenridge, Pa., plant of Allegheny Ludlum.

"There's a maximum weight you want to handle at AOD," said David L. Burk, director of manufacturing methods at Allegheny Ludlum. If your weighing system has a variance of 10 tons plus or minus, he said, you have to stay that much under maximum.

"If you can control the weight so you're within three tons of the maximum," he said, "your throughput is going to be higher. That's the way we're going with all the parameters we have to control."

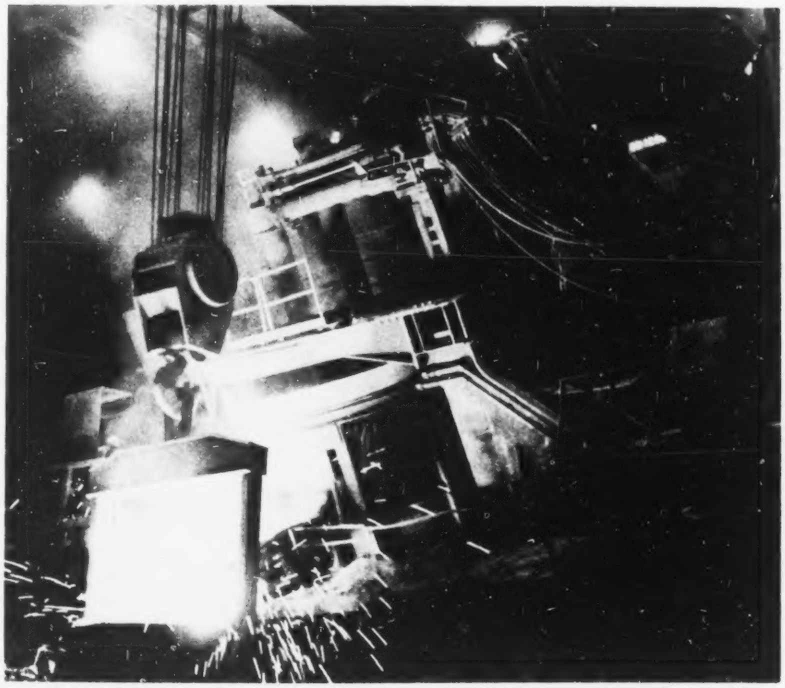
(The ASEA crane scale has a load cell with an error of 0.015 pct. The big benefit of the crane-mounted scale at Brackenridge is it makes weighing fast and more efficient.

The need for tight control is tending to lead toward automatic systems. "A justification for automation is that operators under manual control want to stay far away from the cliff," said Donald J. McMahon, manager of Allegheny Ludlum's process research and development. "As the precision increases, automation will move you closer to the edge."

There is, of course, another big reason for precision. "It's not only the economics," said Mr. Burk. "If you have your process under control, you can make a much more uniform and reliable product."

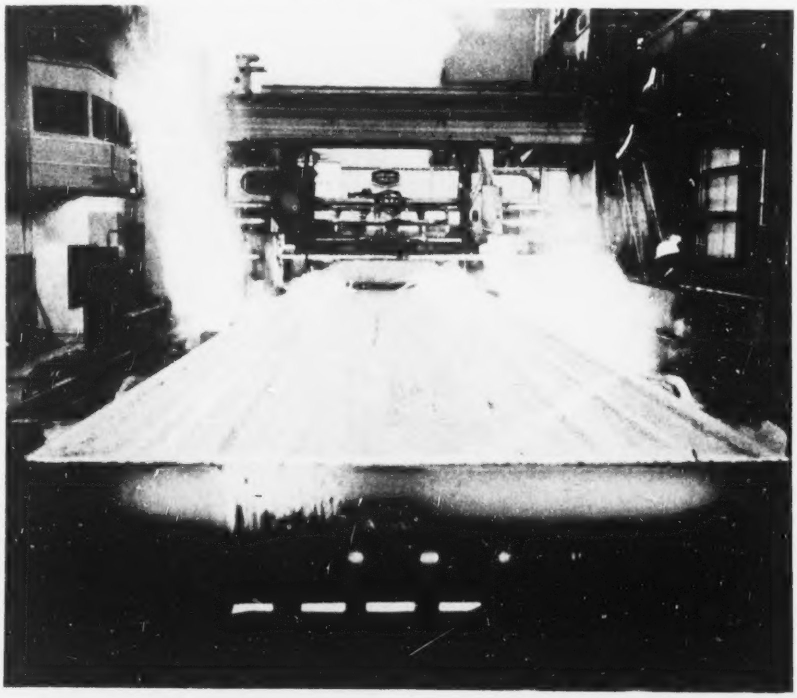
Today's quality standards are such that you can't get by just by playing it safe. "Most people have been overgalvanizing," said Robert Risinger of Scientific Systems Services, Inc. "Not many have control of the process."

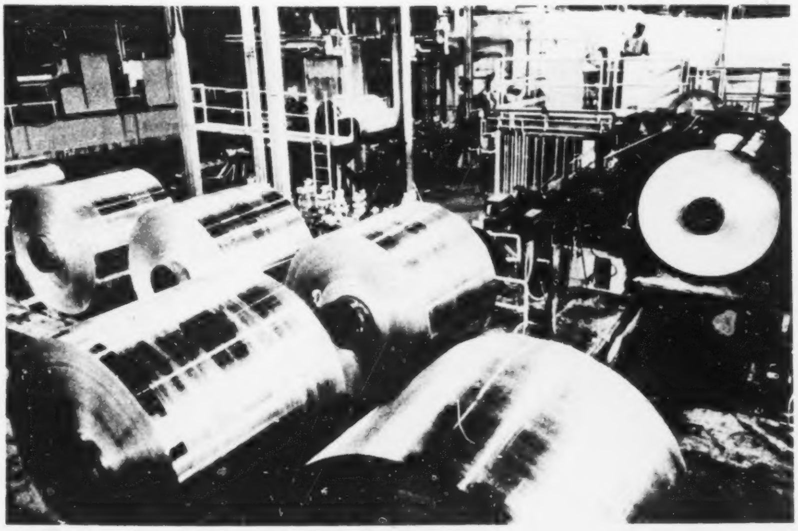
There will have to be control in the future. For measuring zinc coatings,



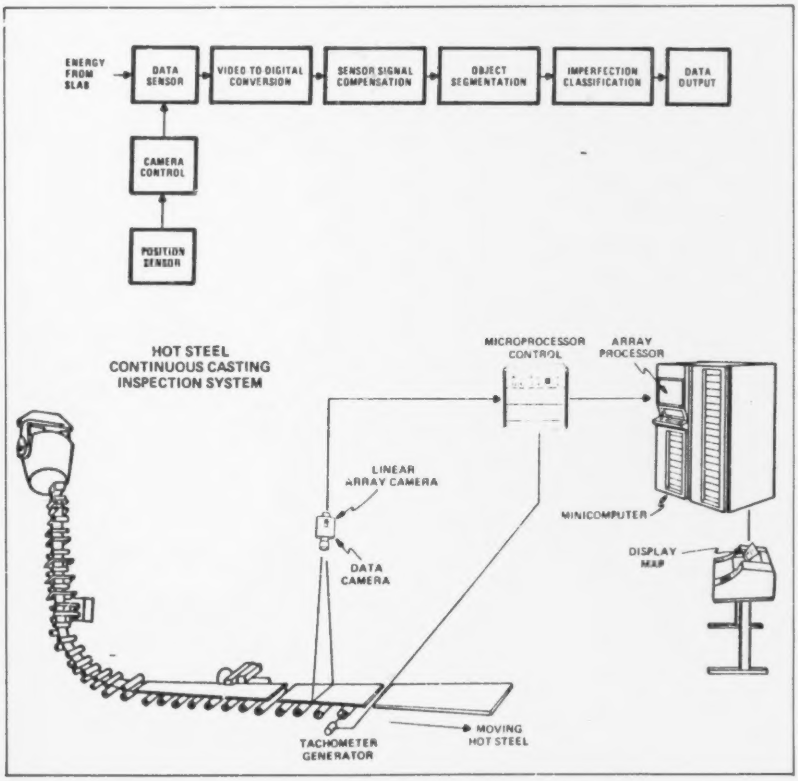
There is no question that computers are going to find increased use in controlling, synchronzing and managing steel plants.

Continuous casting processes like those at the Great Lakes plant of National Steel use control technologies to monitor the quality of the product.





The new No. 7 cold mill at Reynolds Metals' McCook plant electronically measures the width and diameter of alumiunum coil and then feeds information to the computer. Honeywell and U.S. Steel provided the developmental work for the hot inspection of slabs at Gary Works. Below is the functional diagram of the system with the caster's final evaluation system.


ENERGY FROM SLAB
DATA SENSOR
VIDEO TO DIGITAL CONVERSION
SENSOR SIGNAL COMPENSATION
OBJECT SEGMENTATION
IMPERFECTION CLASSIFICATION
DATA OUTPUT
CAMERA CONTROL
POSITION SENSOR
HOT STEEL CONTINUOUS CASTING INSPECTION SYSTEM
MICROPROCESSOR CONTROL
ARRAY PROCESSOR
LINEAR ARRAY CAMERA
MINICOMPUTER
DATA CAMERA
DISPLAY MAP
TACHOMETER GENERATOR
MOVING HOT STEEL

General Motors Corp. has gone to what is called the one-spot test. This involves checking the zinc quantity on a smaller sample than had been used before.

Scientific Systems has joined with Hostetler & Decker, Inc., MEA, Inc., and Reliance Electric in a galvanizing system known as AUTOCOAT. This is designed to give closely controlled hot dipped coatings.

With quality and cost pressures mounting, steel companies are pushing hard for better controls. "We will spend $60 million on computers and systems hardware in 1984," said Donald H. Trautlein, chairman of Bethlehem Steel Corp.

"When you add this to our commitment of about 1,000 systems people," said Mr. Trautlein, "we are talking about an investment of well over $100 million a year in this area."

National Steel Corp. expects to spend $15 to $20 million a year on projects that are strictly for process control. "That doesn't include the controls and automation we will have on our new electrogalvanizing line," said James N. Howell, National's engineering vice president.

National's broad strategy calls for a distributed control system. Direct controls will be decentralized but connected to a hierarchial network. This seems to be typical of today's steel systems.

Sheet Mills Shape Up

To assure flatness in sheet products, Bethlehem is installing at Burns Harbor the Vidimon shape meter of the Davy McKee Equipment Corp. This is part of a general rush to shape control.

"We've gotten six orders in the steel industry since last September," said Douglas A. Berg, vice president and general manager of Davy McKee Equipment Corp.

Designed for cold mills, the Vidimon employs a segmented roll to register loads across the width of a strip. Wavy edges or loose centers are corrected by roll bending or by variations in the cooling pattern.

Three of the Davy McKee shape controls are going in at National Steel Corp. and two more at Inland Steel Co. The one at Bethlehem's Burns Harbor plant is unique in that the control will be tied in with an inflatable roll from

The Topography of Strip

"This is a more difficult problem than defining the earth's topography from space," said Walter A. Wilson, supervisor, ASR, at the research center of National Steel Corp.

Dr. Wilson was talking about high-speed inspection of metal strip. He was not speaking in a loose, figurative way; space experts had told him it was easier to pick up small objects from satellites than to inspect the surface of a metal surface traveling at speeds up to 6,000 fpm.

That kind of inspection is being sought in a development program now underway at Westinghouse Electric Corp. The aim is continuous, 100 pct scanning of strip during the cold rolling operation.

"This device is something that has been needed for 20 years or so," said William E. Dennis, manufacturing vice president, American Iron & Steel Institute (AISI).

Past development attempts were unsuccessful but there is optimism now that a cost-effective system can be devised.

Making for optimism is an extraordinary joining of forces. Working through AISI, six steel companies and three aluminum companies are jointly sponsoring the Westinghouse project. Joint research is a fairly new thing for steel companies. Until this newest program, it was unheard of for aluminum and steel companies to cooperate on research.

The new approach reflects a common need for prime surface quality. "The customer has upgraded his requirements," noted Nick L. Brower of Alcoa Labs.

The participants feel joint activity will be more effective than isolated programs. An obvious advantage of the team approach is that it provides more money than an individual company could afford. The nine sponsors of the inspection effort will each contribute around $100,000.

Less obvious benefits are noted by Dr. Dennis. "It brings together very bright people from two industries," he said. "There is good synergism. And if we are successful, it affords Westinghouse a good market opportunity."

The more sponsors for a program, the more sales prospects. This is a real consideration because the limited market for metal sensors has made suppliers reluctant to undertake costly development programs.

For the supplier, there can be another advantage to joint effort. "If you work with individual companies, you get a bewildering set of requirements," pointed out George F.Mechlin, vice president, Westinghouse Research and Development.

All these factors have brought a broad program of joint research in steel. AISI has launched some 15 projects, including four for advanced sensing devices. A further broadening has drawn aluminum companies into the inspection research.

"You've got to view this as a milestone," said Dr. Dennis, who has been a driving force behind the joint activity of AISI.

Another big step is expected to be the participation of aluminum companies and General Motors Corp. in the hot metal sensor program at Los Alamos National Laboratory.

None of which means the Westinghouse strip inspection program is assured of success. In the harsh environment of a rolling mill, the inspection device must collect a vast amount of information and distinguish between significant flaws and such harmless things as drops of water or oil.

This must be done on a real time basis. "It's a process control tool," Mr.Dennis added. The device is expected to permit preventive and corrective action rather than just after-the-fact inspection.

Both the steel and aluminum people emphasize that they are providing good surface quality now. However, this entails rejection of a certain percentage of off-grade sheet. The new device should lower costs by increasing yields.

The device may also help to break down the barrier that now separates space age research from industrial application.

One of the great puzzles and frustrations, Dr. Dennis indicated, is that the U.S. dominates the Nobel prize competition yet lags in the use of advanced technology.

One form of space technology will be tried in the trip inspection system. "The thing that makes you optimistic is the tremendous advance in computer pattern recognition," said Dr. Mechlin.

This technique, which is used to enhance photos of planets, will permit the classification of surface conditions.

"In phase one," read the official announcement, "Westinghouse will investigate the use of variable optical illumination with multiple detection, followed by high-speed thresholding and data collection circuits which will feed a computerized defect classification."

This mouthful is boiled down by Thomas F. Porter, project manager for Westinghouse.

From the volume of information being transmitted by the optical scanner, reported Dr. Porter, the system will attempt to single out areas of probable imperfection. These will be subjected to rigorous recognition analysis.

Phase One of the program will be limited to investigation. Subsequent phases are expected to move through the test and prototype stages.

Participants are Armco, Inc.; LTV Steel Corp.; Cyclops Corp.; Bethlehem Steel Corp.; Inland Steel Co. and National Steel Corp. The aluminum sponsors are Alcoa, Kaiser Aluminum & Chemical Corp., and Reynolds Metals Co. ☐

Blaw-Knox.

"To our knowledge, that will be the first closed-loop, variable crown system for steel in the world," said Mr. Berg.

Bethlehem has a broad program of flatness control. "We'll probably put in a shape gage at Sparrows Point," said Roger L. Whiteley, vice president, production technology.

Inland is pleased with early results from its Davy McKee shape system. "It's really working very well," said Lionel Cartright, superintendent of process automation for Inland. "Right now, we're monitoring the profile. Within the next week or so, we're going on control."

Inland, is one of a number of mills that are going to hydraulic roll positioning. A hydraulic force system from E.W. Bliss Co. is going on a four-strand mill at Inland. Bliss supplied a hydraulic system to LTV Steel and is building a unit for Rouge Steel.

U.S. mills have been slow in going to hydraulic actuation, but the operating advantages seem to be bringing greater acceptance. Bliss officials point out that hydraulic systems are fifty times faster than electro-mechanical systems.

The first shape control system in the U.S. was installed at the Warren, Ohio, plant of LTV Steel Corp. Used on a four-strand cold mill, this is an ASEA Stressometer flatness control system.

"It's working well," said Ronald Miner, senior manager of research for LTV. Experience has been good "even just by observation, independent of the closed loop control."

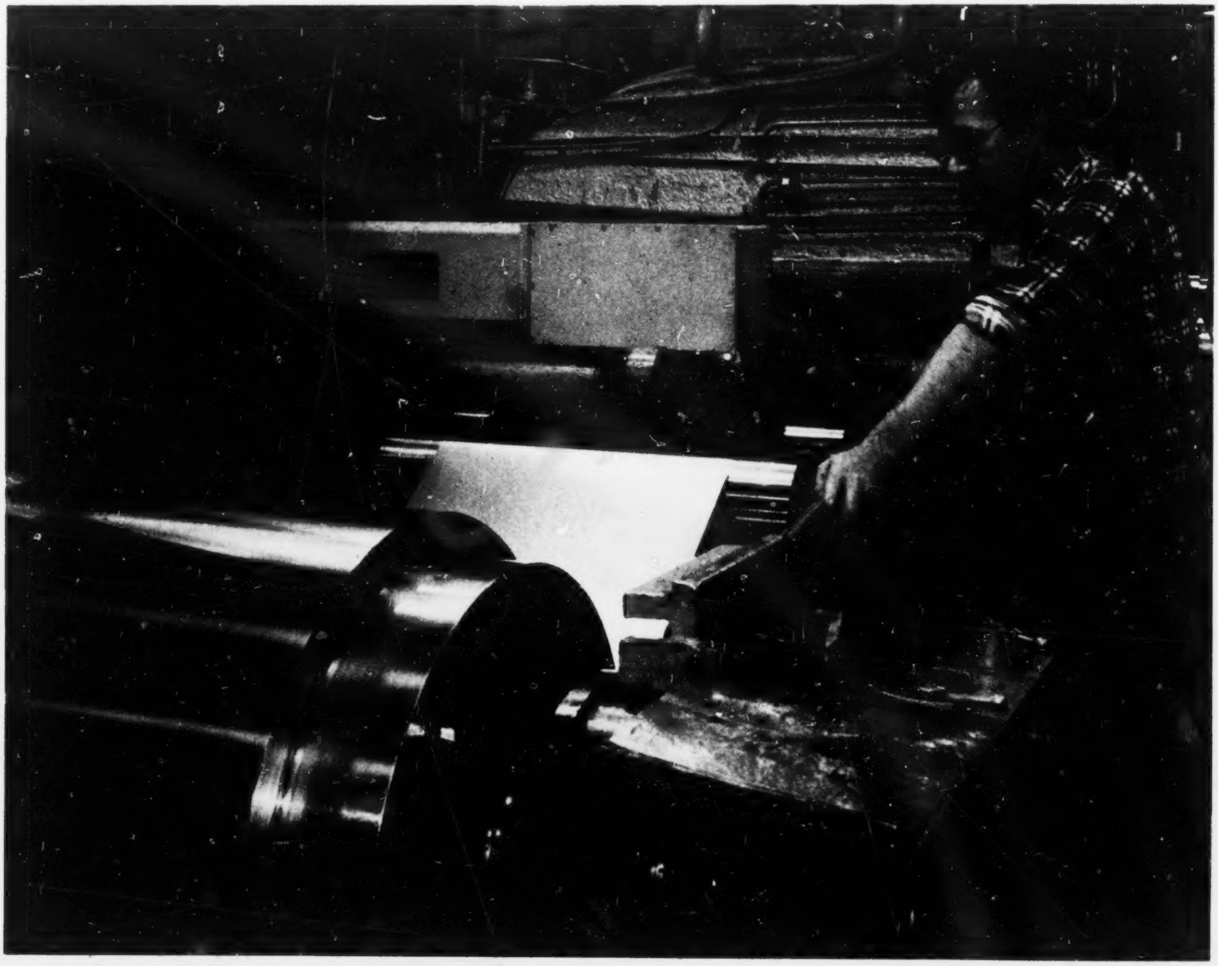
The closed loop system at Warren is tied into roll bending. The mill has not been equipped with distributed cooling.

Flatness controls for both aluminum and steel have been widely used abroad. A wholesale conversion to these controls is now underway in the U.S.

"It's where automatic gage control was 10 years ago," said Ian Russell of ASEA. "We have seven or eight active inquiries."

In both the auto and electrical markets, there are specific demands for good shape," said Mr. Miner. In all

Companies like Accuray Corp., offer systems to measure the thicknesses of steel and other metals. Shown here is the company's 7000 Micro System.



markets, there is general consciousness of quality, he said.

In the U.S. and abroad, the use of shape systems has been confined almost entirely to cold mills. Everyone says this is doing things backwards.

"Dimensional consistency starts at the hot mill," said Mr. Howell of National Steel. "We've got to do some things at the hot mill to provide that consistency."

These things weren't done in the past because it's difficult to make precise measurements of red hot strip traveling at more than 3,000fpm. Now, there is work in this area.

Davy McKee is offering for hot mills something called the Tensometer Shapemeter. Developed at Hoesch in West Germany, the system employs a series of rotors on a lever. The assembly is mounted in place of a looper between the last and next to last stands.

A different approach to hot mill shape control uses non-contact measurement. At Burns Harbor, Bethlehem plans to use three Optocator probes for monitoring shape on the hot mill.

"The Opticator is a distance measuring device," said David R. Wiese, director of engineering, Selective Engineering, Inc., (Selcom) of Valdese, N. C.

Bethlehem's installation will probably be the first attempt to flatness monitoring on a hot mill in the U.S. The decision to tackle this tough job reflects a new spirit in the domestic industry.

"They seem to be willing to spend money just to learn," said Mr. Wiese.

Allegheny Ludlum, which has a number of Optacator units, is working on flatness, but no details have been released. Other Optacators have been delivered to Kaiser Aluminum and Chemical (for gaging hot slabs) and to Edgewater Steel Corp. for final inspection of forged wheels.

A novel application of Optacators is in a system built by Contraves-Goerz. This is designed to measure the wall thickness of tubular products. Readings are taken while the steel is still hot and take only 30 seconds.

"It's a non-contacting gage," said Robert S. Moschetti, sales manager, industrial control systems, Contraves Goerz. "It can measure pipe hot. It's fast."

Not to be confused with the work on shape is the new push to improve the profile of strip. Shape is a function tension variations across the width of strip. Profile involves thickness variations across width.

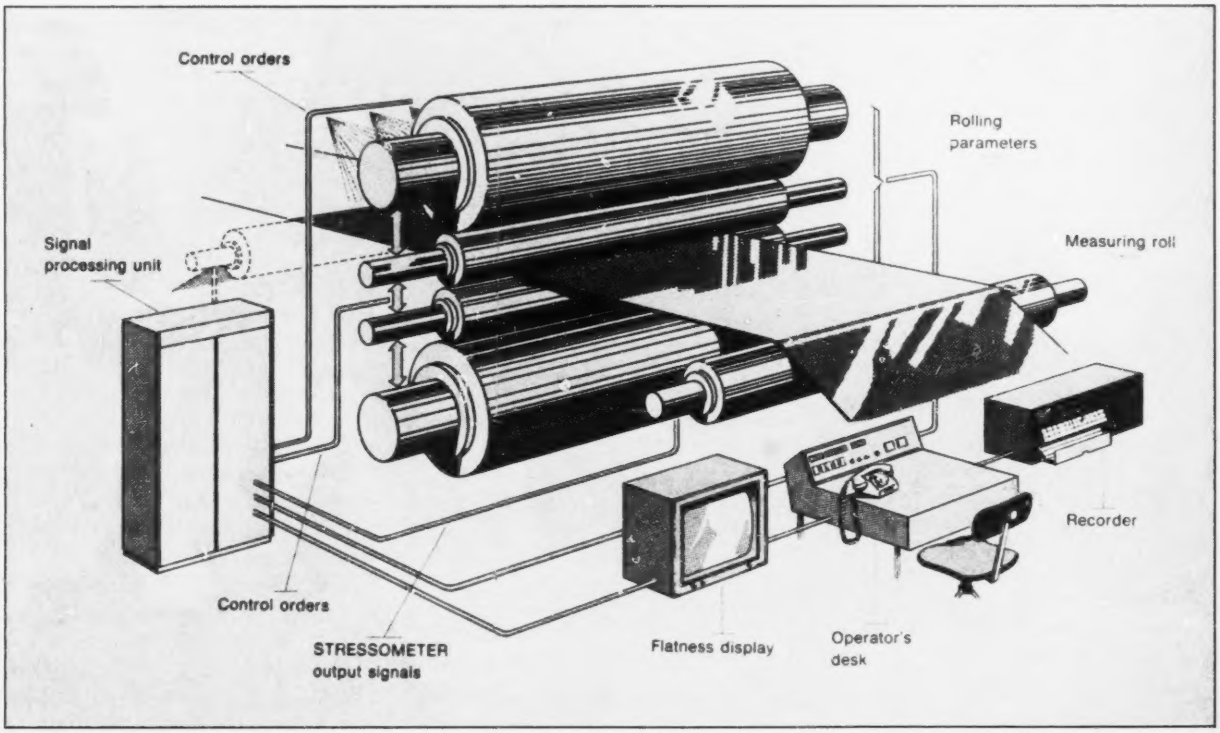
Hot mills and cold mills have long been equipped with sensors and controls that attempt to maintain constant thickness along the length of strip. AccuRay Corp. and Weston Controls are among the leading suppliers of gage sensors. There has been a steady upgrading of the speed and precision of gage controls.

Now being explored is the feasibility of getting constant gage across the width of the strip. If a perfectly regular profile could be maintained at the hot mill, it would have direct quality benefits and it would go a long way towards eliminating flatness problems.

"We've seen a push at the hot mill," said S. J. Outhwaite, manager of gage products for Weston.

At the moment, operators are just

An ASEA Stressometer at Republic Steel's Warren plant adjusts roll pressure to insure uniformly flat sheet.



trying to get a good picture of thickness. "By monitoring his profile, he gets an idea how healthy his strip mill is," said Mr. Outhwaite.

It's expected that data will eventually be fed back into corrective systems.

Direct Sensing

Steel producers are groping for the ideal mix of computer and physical control device. Dr. Pitler feels the sophistication of the computer system should be partly governed by the quality of the information available.

"It depends on how good your sensors are," he said. "If you've got a 79¢ phonograph record, you're not going to play it on a $2,000 hi-fi set."

A similar comment comes from Mr. Howell of National Steel. "Process control is great, but if you don't have a sensor to sense that key element, what's a computer going to do for you?"

For this reason, the American Iron & Steel Institute (AISI) has launched a joint research program aimed at developing some badly needed sensing devices. (See Box).

"No amount of numbers crunching will substitute for sensors," said William Dennis, manufacturing vice president of AISI and a key man in the joint program.

The reverse may sometimes be true. "If you had continuous sensing of the parameters you wanted to measure, you would not need any computation," said Dr. Pitler.

"You would like to have continuous hot metal sensor," he said. "You would like a continuous temperature sensor."

One of the AISI programs is directed at finding a hot metal sensor. Important progress has already been made in this area. Bethlehem Steel and Japan's steel companies have developed dynamic controls for oxygen steelmaking.

A fairly ingenious temperature system is being used by LTV Steel in reheat furnaces at Indiana Harbor and Cleveland.

"The difficulty in measuring temperature in a reheat furnace is that you have a lot of radiation bouncing around," explained Mr. Miner. "This can be bouncing off the surface of the steel but it really doesn't reflect steel temperature.

"What you need is characterize that reflected radiation and differentiate it from the steel temperature."

Researchers at what had been Jones & Laughlin came up with a two-pyrometer system which makes this separation.

From the Republic side of the merger came a device that gives on-line measurement of weld quality in pipe. Republic also contributed the on-line flatness control at Warren.

Honeywell's TDC 3000 is the company's new offering for controlling the steelmaking operation in the industry.

At Raritan River Steel Co., a billet reheat furnace has been equipped with controls from Davy McKee. Called Thermod, the control system is reportedly boosting furnace output and reducing fuel consumptions. Fuel savings of 5 to 7 pct were reported in June and when broken in, the system was expected to reduce fuel use 10 to 15 pct.

As this suggests, the reheating operation is getting considerable attention. Slab furnaces consume more than two million BTU a ton. What steel men would really like is to bypass the reheating operation partially or completely.

The difficulty is that slabs must be allowed to cool for inspection and conditioning. As a way around this, a hot inspection system is being sought.

U.S. Steel and Honeywell worked on an inspection system that employed a linear array camera to map slab surfaces. Results were encouraging and Honeywell is now conducting a Department of Energy study to find the optimum site for a two-sided inspection system.

"We think it's primarily an engineering job," said Donald E. Waters, program manager for Honeywell. He was referring to the advance from one-side to two-sided inspection. "We hope to firm it up in the next six months."

In a technical report last year, the commercial timetable was discussed by S.B. Prellwitz, consulting systems engineer for U.S. Steel.

Individual companies are working on hot slab inspection. "We have a very active program," said Mr. Howell of National Steel.

Inland also has a program. "The other thing we're doing," said Mr. Cartwright, "is installing a home-grown television monitor to look at the bottom of slabs."

Others are looking and hoping. "An inspection device would have great value," said Mr. Whiteley of Bethlehem.

Some steel men fear that a successful scanner would also have great cost. The cost factor keeps cropping up as steel people try to avail themselves of space age technology.

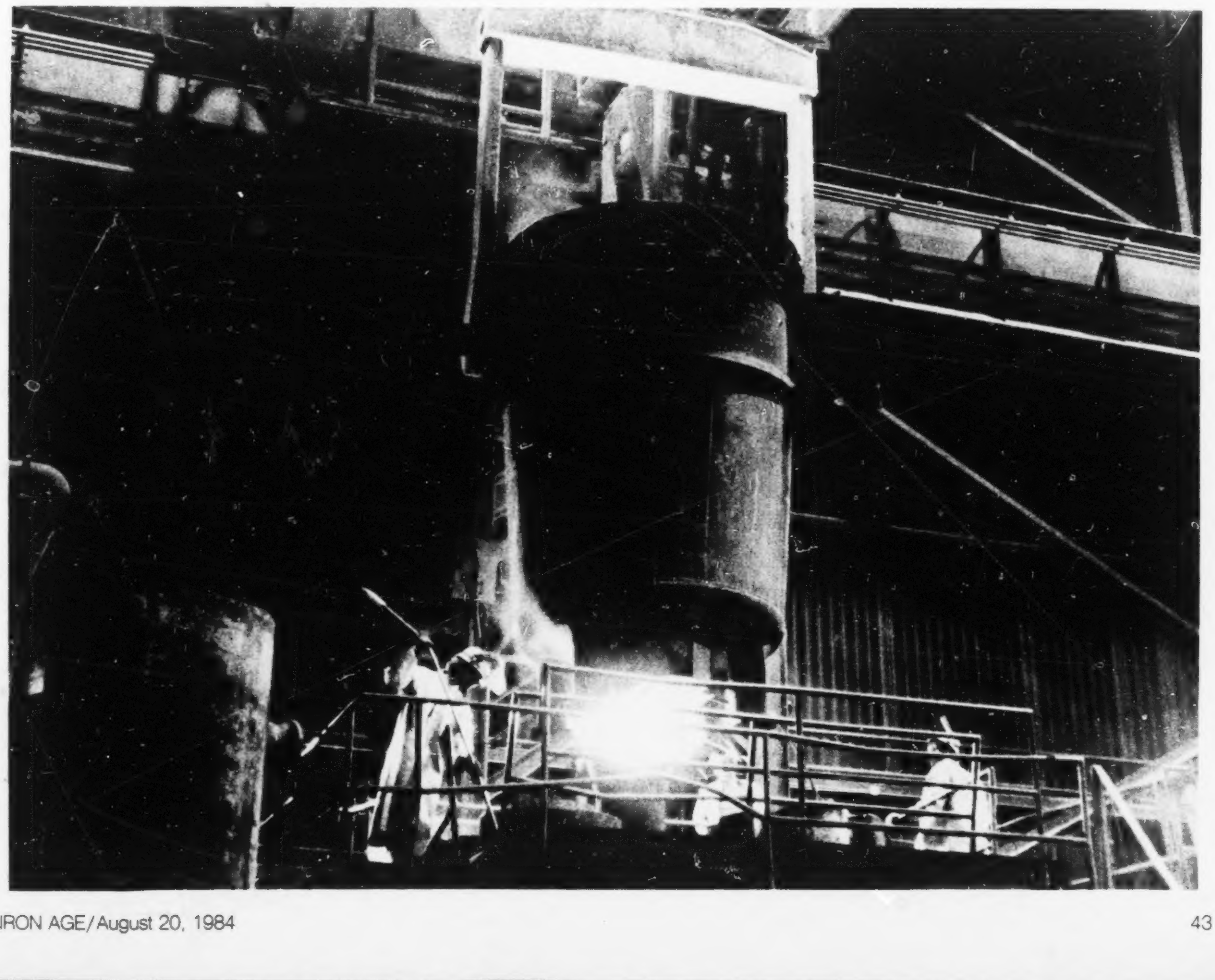
Computers

For continuous casting and a great many other operations, there are gaps in the sensor lineup. Steel producers must rely to a considerable extent on indirect quality measurements. This entails computation and computers.

"We have a computer system that gathers all the variables during the casting process," said Mr. Cartwright. "It makes the decision on whether the steel can be directly hot charged or whether we go into scarfing."

If casting speeds and other variables are on target, the slab surface should be

Steel producers have been groping for a perfect mix of a computer and physical control device.



flawless. "It never quite works out that way," grumbled one engineer.

It is true, however, that close monitoring of the casting process helps in predicting quality. "You can infer an awful lot about the quality of the slab surface from the operating parameters," said Mr. Miner.

You also can tell a lot about a BOF by analyzing off-gases and calculating carbon content. Most shops are still relying on this type of indirect measurement along with predictive models.

"You have to get the static control working properly and then take the next step into the dynamic control," said Mr. Howell of National.

At the direct control levels, minicomputers and microprocessors are finding extensive use. It's possible the popularity of the distributed system is bringing excessive computerization.

"I wonder if the driving force is vendor philosophy or user philosophy," said Charles Slusher, supervising project engineer for Armco, Inc. "A lot of the equipment is coming through imbedded with programmable controllers and microprocessors."

One vendor cautions against unnecessary complexity. "It swings both ways," said Richard J. Bowman, president, I/O Controls, Inc., Newtown, Pa.

A few years ago, the mills were extremely wary of high technology systems, said Mr. Bowman, whose company has supplied average gage systems to Bethlehem at Sparrows Point and to a number of U.S. Steel plants.

Now, he said, the mills are crying for computer systems. "They're coming after us." Mr. Bowman said operators can react in a negative way to overly elegant control systems.

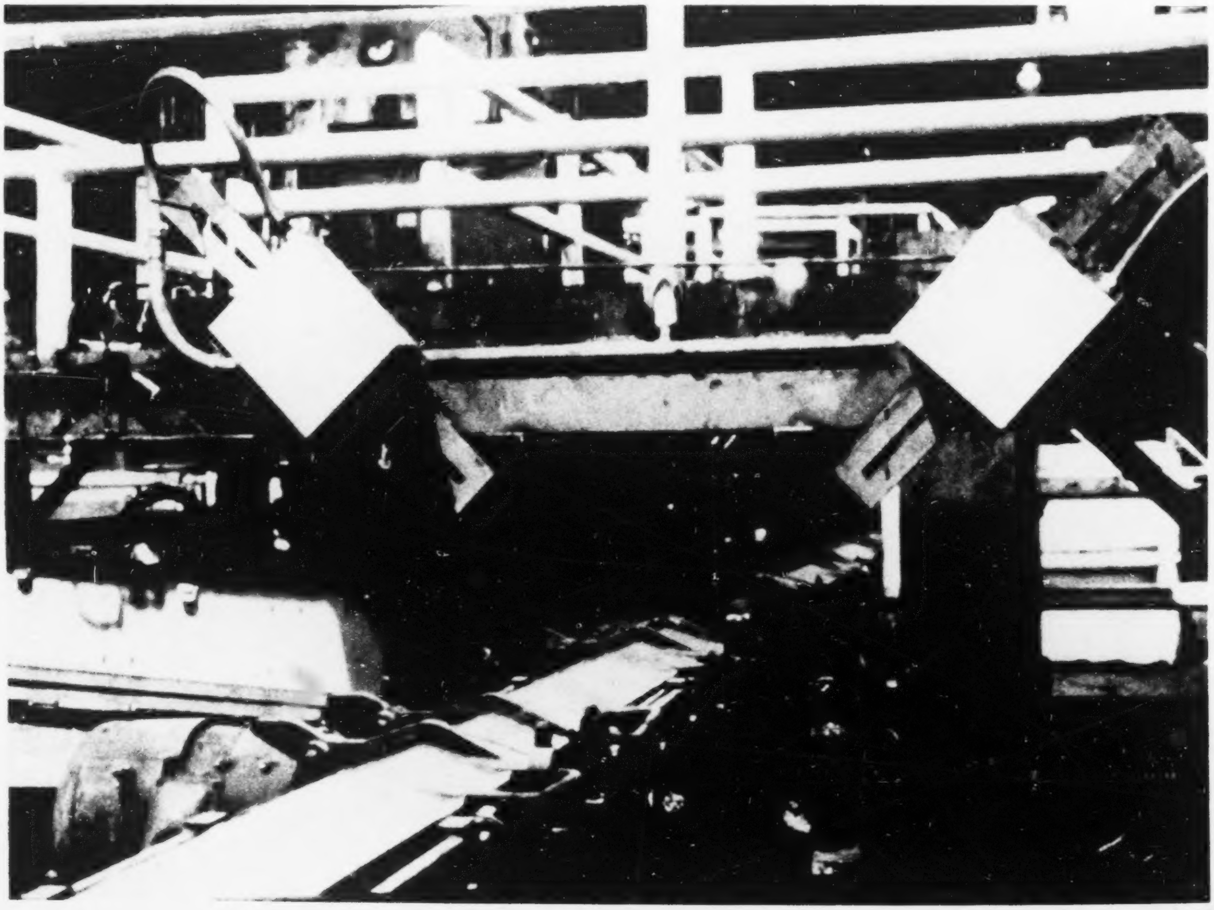
"You're dealing with people who are afraid of computers," he said. This fear will often translate into poor performance, he added, while operators will respond favorably to simplicity.

Another supplier reports this view. "I tend to agree some instruments are being made too complicated," said Lawrence C. Meredith, group marketing manager for AccuRay Corp.

Mr. Meredith pointed out, however, that computerization can also simplify controls. For its 7000 gage control introduced last year, AccuRay went to a microprocessor. This made it possible to reduce the number of printed circuits from 12 to 13 to only four. There are fewer components to go wrong, said Mr. Meredith, and the microprocessor provides diagnostic information.

The main reason AccuRay went to the computer was to upgrade the sens-

Vision systems like this one from Opcon are used to measure the diameter of hot seamless steel pipe.



ing function. The microprocessor can digest signals 100 times a second. This makes it possible to have a gage that is accurate to within 1/10th pct. The previous model went down to ¼ pct.

There is no question computers are going to find increased use in controlling, synchronizing and managing steel plants. Operators could be overwhelmed with information, but one development is helping in this regard.

"We're seeing more than more graphic usage," said Mr. Slusher of Armco. "Especially color graphics because you can integrate so much more in a display."

Dr. Burk of Allegheny Ludlum speaks of a "window on the process.... Every instrument vendor, every computer company—even IBM—is now in the field selling graphic display systems to try and assimilate all this information."

There is another significant development. Some very high powered computer companies are becoming deeply involved in the hardware and software of steel process controls.

At John Lysaght in Australia, a cold rolling mill is being controlled by a computer from Hewlett Packard. Designated HP 2250, the system with all spares had a cost of $850,000. Officials of John Lysaght estimated yearly savings at $500,000.

At Contraves-Goerz in Pittsburgh, a system for measuring wall thickness of pipe is in the final stages of testing. In the same room with this unit are highly sophisticated devices for tracking satellites and missiles.

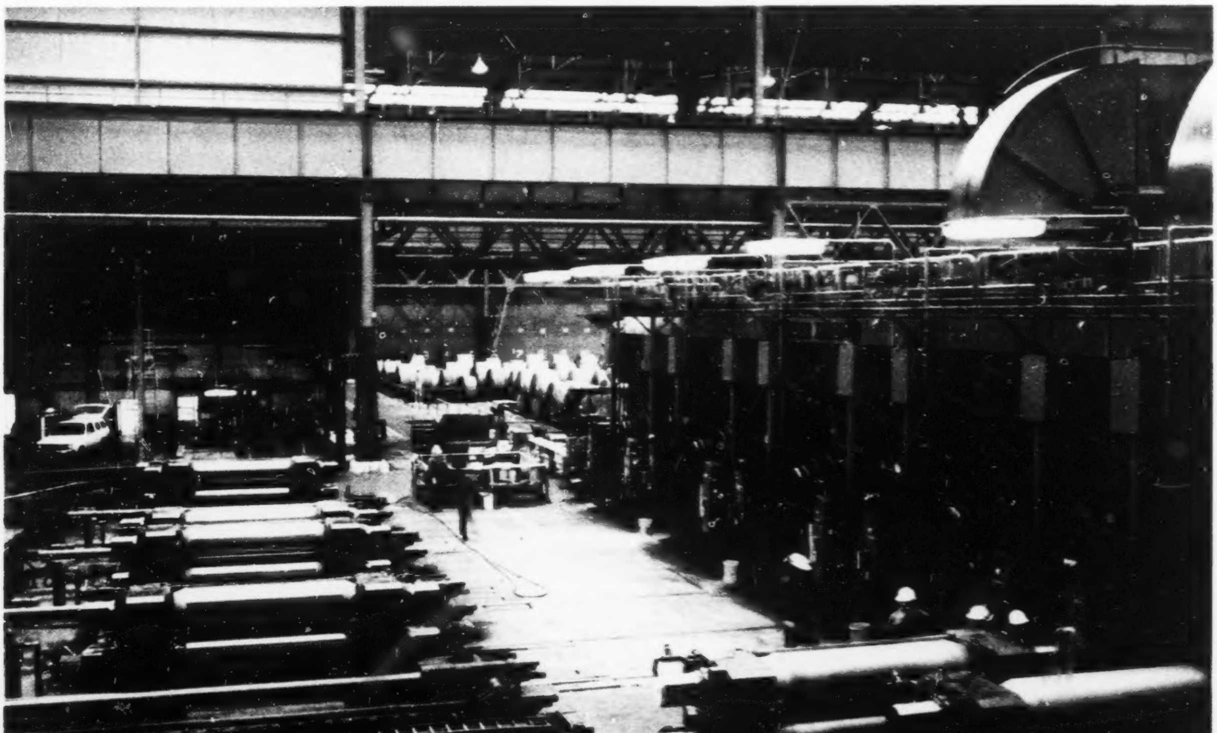
The steel instrument didn't look out of place next to the space hardware. The measurement of wall thickness is accomplished by inserting one laser depth gage into the center of the pipe and positioning another depth probe on the outside.

The probes rotate and wall thicknesses are calculated at intervals around the circumference of the pipe.

The growing involvement of suppliers is changing the role of the steel engineer. "We're now integrators," said Mr. McMahon of Allegheny Ludlum.

Dr. Pitler stresses the need for balance. "You've got to be careful you don't become so enamored of the gadgetry or the calculations that you lose sight of what you're really trying to do." □

Reprints available while supply lasts. For single copy, circle No. 97 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1066



Precision cold rolling of sheet at John Lysaght in Australia is accomplished by a Hewlett Packard computer.

2nd QUARTER EARNINGS

STEEL STALLED; NONFERROUS GAINS SLIGHTLY

BY GEORGE MCMANUS & ROBERT REGAN

After a rebound in the first quarter steel companies were slapped back down again. In the nonferrous sector, aluminum continued to show the way with copper and nickel still waiting for a pickup in the capital goods.

Steel

A cruel fate gave steel companies a small taste of prosperity in the second quarter then shoved the companies back down again.

Prosperity was in the form of profits for most of the mills. The downward shove was supplied by a 10 to 15 pct drop in shipments in the third quarter. The decline will mean profits that are skimpy or nonexistent.

Earnings weren't exactly robust in the second quarter. The combined profit of the five largest mills came to 1.6 pct of sales. Armco, Inc. and LTV Corp. continued to lose money.

However, 15 steel producers moved from red ink in the second quarter of 1983 to black ink in the second quarter of 1984.

There were some decisive upward swings. United States Steel Corp. went from a net loss of $112 million in 1983 to a profit of $140 million in 1984...The steel portion of U.S. Steel had an operating profit of $84 million in 1984. That compared with an operating loss of $130 million in the second quarter of 1983.

For Bethlehem Steel Corp., a second quarter net profit of $24 million was the first since 1981. The market slide was noted by Donald H. Trautlein, chairman of Bethlehem.

"As a result, we expect to be at about a break-even level for the third quarter," said Mr. Trautlein.

National Intergroup, Inc., made one of the stronger showings in the second quarter. National's net income of $24.6 million came to 3.1 pct of sales. The net was reduced by a non-recurring charge of $16.9 million. Without this, the sales margin would have been 5.2 pct.

Inland Steel Co. continued its profit recovery in the second quarter. The $24.6 million earned by Inland was up from a loss of $29.7 million in the second quarter of 1983.

Somewhat surprising was Armco's second quarter net loss of $14.1 million. High interest charges and continued losses in the oil country business contributed to the deficit. Armco's carbon steel segment had an operating profit of $44 million for the first six months of 1984.

Armco doesn't expect its oil country business to earn money in the second half. The energy field is one of many where capital spending is still lagging.

LTV had a net loss of $22.7 million in the second quarter. Like Armco, LTV was hit by higher interest charges and by the depressed state of the oil country market.

Not included in LTV's results were the financial returns of what had been Republic Steel. Republic is now part of LTV Steel but its second quarter earnings results won't be available for a month or so.

The profit of employee-owned Weirton Steel Corp. jumped from $9.6 million in the first quarter of 1984 to $22.7 million in the second quarter. Weirton's 7.4 pct return on sales was the highest for any of the big mills.

It appears that Weirton is making good on a game plan that calls for expanded sales of cold rolled sheet. The company shipped 611,000 tons in the second quarter. That was up 6.6 pct from the first quarter.

Nonferrous

Leading nonferrous metals companies continued to trudge their way toward recovery in the second quarter of 1984. Aluminum once again had a better time of it than did producers of copper and nickel, however.

Low copper prices adversely impacted results of Asarco and Phelps Dodge Corp., both reported losses in the period, and also helped pull Newmont Mining's profits lower by 20 pct.

A sleeping capital goods sector is limiting the recovery capability of the copper and nickel industries. In nickel, Inco Ltd.'s operating results for primary metals and alloy products were in the black in the second quarter and first half, its shipments of nickel and copper were higher in the second quarter and first half and average nickel prices were higher as well. The benefits, however, extended only to cutting the second quarter loss to $15.1 million from the $37.1 million loss in the same 1983 period. And the company's nickel stocks rose to 94 million lbs from the 83 million lbs on hand at the start of the year.

Price recovery was the main contributor to sales and profit gains by North American's four largest aluminum producers. Aggregate shipments by Aluminum Co. of America, Alcan Aluminum Ltd., Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp. were down 4.6 pct to 1.42 million short tons, but aggregate gross revenues were up 17.6 pct to $4.96 billion. All four operated in the black in the period just ended (Reynolds and Kaiser were in the red in the second quarter last year) and aggregate profits equaled $280.6 million compared with a negative $82.8 million in the second quarter last year.

(Cont. on p. 54)

STEEL SHOWS SOME UPWARD MOVEMENT

SECOND QUARTER PROFIT REPORT—1984 (In Millions of Dollars)

		EARNINGS			SALES		
	1984 E/S	2nd Quarter 1984	2nd Quarter 1983	Pct Change	2nd Quarter 1984	2nd Quarter 1983	Pct Change
USS	2.9	$140.00	$(112.00)	—	$4,900.00	$4,400.00	+11%
BETHLEHEM	1.6	24.00	(70.70)	—	1,505.10	1,234.60	+22%
ARMCO	—	(14.10)	(75.80)	—	1,196.00	1,079.00	+11%
NATIONAL	3.1	24.64	(99.17)	—	794.86	752.14	+5.7%
INLAND	2.6	24.65	(29.74)	—	938.95	748.12	+26%
LTV*	—	(22.70)	(61.30)	—	1,580.30	993.70	+59%
TOTAL	1.6	176.49	(448.71)	—	10,915.21	9,207.56	+19%
WHEEL-PGH	1.9	5.30	(18.89)	—	279.08	191.57	+46%
INTERLAKE	4.1	10.24	3.58	+186%	248.56	206.01	+21%
CYCLOPS	1.7	5.51	(0.45)	—	317.11	243.20	+30%
CF&I	2.5	2.21	(14.67)	—	89.86	56.93	+58%
COPPERWELD	6.9	8.54	(12.37)	—	124.42	79.98	+56%
CARPENTER	7.9	12.80	9.70	+32%	162.86	112.39	+45%
LUKENS	2.7	3.11	(3.33)	—	113.96	87.27	+31%
PHOENIX	—	(0.74)	(6.96)	—	32.64	30.20	+8.1%
FLORIDA	1.3	0.94	0.76	—	72.09	61.52	+17%
LACLEDE	3.8	2.23	1.41	+58%	59.29	45.56	+30%
NUCOR	5.4	9.2	4.8	+8.9%	169.0	127.6	+32%
EASTMET	1.8	1.26	(2.56)	—	69.03	42.60	+62%
WEIRTON	7.4	22.75	—	—	306.28	—	—
QUANEX	3.3	3.51	(0.25)	—	106.45	74.63	+43%

*Does not include Republic Steel

ALUMINUM STILL CLIMBING; NICKEL AND COPPER STILL WAITING

SECOND QUARTER PROFIT REPORT (Millions of Dollars)

( ) = Denotes Loss

	Earnings			Sales and Other Revenues		
	2nd Q 1984	2nd Q 1983	Pct Chg.	2nd Q 1984	2nd Q 1983	Pct Chg.
ALCAN	$98.0	$3.0	+3,166.7	$1,478.0	$1,329.0	+11.2
ALCOA	112.8	34.6	+226.0	1,452.3	1,257.9	+15.5
AMAX	9.8	(21.2)	—	651.4	567.8	+14.7
ASARCO	(28.6)	27.6	—	357.2	380.3	−6.1
BRUSH WELLMAN	10.7	6.3	+69.8	84.6	60.5	+39.8
CABOT CORP.	26.5	14.1	+87.9	468.3	389.0	+20.4
COMINCO	24.8	(3.7)	—	439.2	413.5	+6.2
ENGLEHARD	18.4	18.0	+2.2	606.0	617.0	−1.8
FREEPORT MCMORAN	25.9	20.9	+23.9	217.8	186.2	+17.0
INCO LTD.	(15.1)	(37.1)	+59.3	385.0	284.0	+35.6
KAISER ALUMINUM	32.5	(51.3)	—	1,017.2	781.9	+28.9
MARTIN MARIETTA	74.1	57.0	+30.0	1,176.0	953.5	+23.3
NEWMONT MINING	12.6	15.8	−20.3	203.4	186.9	+8.8
NORANDA MINES	19.4	9.2	+110.9	986.6	795.1	+24.1
OLIN CORP.	33.0	24.0	+37.5	545.3	490.3	+11.2
OREGON MET	1.0	(0.3)	—	10.4	8.9	+16.9
PHELPS DODGE	(20.7)	0.3	—	255.8	282.1	−9.3
REYNOLDS METALS	37.3	(69.1)	—	1,003.1	853.4	+17.5
VULCAN MATERIALS	25.6	15.4	+66.2	259.2	199.9	+29.7

Alcan Aluminum Ltd.: Net for the '84 period includes an $11 million tax-loss carryforward. **Amax Inc.:** Net for the '84 quarter includes tax credits of $5.6 million and a $20.7 million gain on sale of shares in oil and gas interests. **Asarco Inc.:** Net loss for the '84 period includes a pretax charge of $38 million reflecting estimated $60 million cost of closing the Tacoma, Wash. copper smelter and $22 million credit from changes to estimated costs for previous plant closings. **Cominco Ltd.:** Canadian funds. Net for the '84 period includes $5.2 million extraordinary credit gained mainly on sale of U.S. oil investment. **Martin Marietta Corp.:** Net for the '83 period includes pre-tax gain of $67 million from sale of assets. **Phelps Dodge Corp.:** Net loss for the '84 period includes extraordinary gain of $2.4 million. **Reynolds Metals Co.:** Net for the '84 period includes a $3.2 million net charge for closing Jamaican bauxite mining operations.

Reprints available while supply lasts. For single copy, circle No. 85 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1075.

PRICE & PRODUCTION DATA

(Effective August 6, 1984)

Steel production by districts, thousands of tons (000 omitted)	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	185	215	204	179
Pittsburgh	233	247	183	188
Youngstown	86	89	94	91
Lake Erie	125	109	134	105
Detroit	147	156	141	140
Chicago	437	452	450	463
Cincinnati	87	86	108	83
St. Louis	82	77	81	73
Southern	183	186	185	140
Western	71	78	85	84
U.S. Production	1,634	1,695	1,665	1,575

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.

86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective August 6, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,636	1,695	59,770	47,881
Capability Utilization Rate	63.4	65.7	74.5	53.4

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.405	26.217
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 81.83	$ 81.50	$ 82.17	$ 75.17
No. 2 bundles	$ 50.83	$ 50.83	$ 50.83	$ 45.50

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh	$ 86.50	$ 86.50	$ 88.50	$ 79.50
No. 1 steel, Philadelphia	80.50	80.50	80.50	68.50
No. 1 steel, Chicago	78.50	77.50	77.50	77.50
No. 1 bundles, Detroit	70.50	70.50	75.50	71.50
Low Phos., Youngstown	80.50	80.50	80.50	79.50
No. 1 mach'y cast., Pgh	71.50	71.50	79.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi	115.50	115.50	115.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective August 6, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	52.27	52.54	8/6/84
Copper (C)	63.00-64.00	62.00-64.00	8/3/84
Lead	28.00-34.00	30.00-34.00	8/1/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	214.93	209.41	8/6/84
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	50.00	50.00-53.00	7/3/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$349.25
Indium, dollars per troy oz.	$3.30
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$300-$310
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$133
Platinum, per troy oz.	$338
Rhodium, per troy oz.	$700
Silver ingots, per troy oz.	$7.59
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

July 30—564.07
July 31—564.33
Aug. 1—563.27
Aug. 2—564.20
Aug. 3—567.50

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	58½	57½
Yellow brass	55	54½
Red brass	55¾	55¼
Comm. bronze	56⅜	55½
Mang. bronze	57	50
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	46
Light copper	37

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	51
No. 2 copper wire	42
Light copper	33
No. 1 composition	54
No. 1 comp. turnings	52
Hvy. yellow brass solids	37
Hvy. yellow brass turnings	35
Radiators	42

Aluminum

New mixed clips	38	—39
Old sheet	36	—37
Old cast	36	—37
Clean dry borings	37	—38

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	36	—37
Mixed L.C. clips	34	—35
Old sheets and cast	30	—31
Borings and turnings	22	—24
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	46	—47
No. 2 copper wire	38	—39
Light copper	34	—35
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	39	—40
Cocks and faucets	30	—31
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	43	—44

Lead

Heavy soft lead	10	—11
Whole batteries	3	— 4
Type metal	16	—17
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE AUGUST 6, 1984

(Effective August 6, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 86.00	to	$ 87.00
No. 2 hvy. melting	76.00	to	77.00
No. 1 dealer bundles	94.00	to	95.00
No. 1 factory bundles (auto)	90.00	to	91.00
No. 2 bundles	53.00	to	54.00
No. 1 busheling	104.00	to	105.00
Machine shop turn	12.00	to	13.00
Shoveling turnings	49.00	to	50.00
Cast iron borings	48.00	to	49.00
Low phos. punchings plate	101.00	to	102.00
Heavy turnings	76.00	to	77.00
No. 1 RR hvy. melting	92.50	to	93.50
Rails 2 ft. and under	113.00	to	114.00
Scrap rails, random lgth	99.00	to	100.00
RR specialties	105.00	to	106.00
No. 1 machinery cast	71.00	to	72.00
Cupola cast	64.00	to	65.00
Heavy breakable cast	30.00	to	31.00
Stainless			
18-8 bundles and solids	550.00	to	560.00
18-8 turnings	450.00	to	460.00

Chicago

No 1 hvy. melting	$ 78.00	to	$ 79.00
No. 2 hvy. melting	71.00	to	72.00
No. 1 dealer bundles	92.00	to	93.00
No. 1 factory bundles (auto)	87.00	to	88.00
No. 2 dealer bundles	49.00	to	50.00
No. 1 busheling	91.00	to	92.00
Shredder scrap	89.00	to	90.00
Machine shop turn	42.00	to	43.00
Mixed bor. and turn	43.00	to	44.00
Shoveling turnings	47.00	to	48.00
Cast iron borings	47.00	to	48.00
Low phos. forge crop	111.00	to	112.00
Low phos. punchings plate ¼ in. and heavier	121.00	to	122.00
Low phos. 2 ft. and under	116.00	to	117.00
No. 1 RR hvy. melting	83.00	to	84.00
Scrap rails, random lgth	82.00	to	83.00
Reroller rails	108.00	to	109.00
Rails, 2 ft. and under	115.00	to	116.00
RR couplers and knuckles	97.00	to	98.00
RR car axles	129.00	to	130.00
No. 1 machinery cast	115.00	to	116.00
Cupola cast	102.00	to	103.00
Stove plate	99.00	to	100.00
Steel car wheels	103.00	to	104.00
Stainless			
18-8 bundles and solids	490.00	to	500.00
18-8 turnings	420.00	to	430.00
430 bundles and solids	120.00	to	125.00
430 turnings	80.00	to	90.00

Philadelphia

No. 1 hvy. melting	$ 79.00	to	$ 82.00
No. 2 hvy. melting	69.00	to	72.00
No. 1 dealer bundles	93.00	to	96.00
No. 2 dealer bundles	48.00	to	51.00
No. 1 busheling	92.00	to	95.00
Shredder scrap	98.00	to	101.00
Machine shop turn	29.00	to	32.00
Mixed bor. and turn	29.00	to	32.00
Shoveling turnings	41.00	to	44.00
Low phos. 5 ft. and under	95.00	to	98.00
Low phos. 2 ft. punchings	115.00	to	118.00
Electric furnace bundles	101.00	to	104.00
RR specialties	100.00	to	103.00
Rails, 2 ft. and under	117.00	to	120.00
Cupola cast	70.00	to	73.00
Heavy breakable cast	57.00	to	60.00
No. 1 machinery cast	97.00	to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 51.00	to	$ 52.00
No. 2 hvy. melting	50.00	to	51.00
No. 1 dealer bundles	70.00	to	71.00
No. 2 bundles	35.00	to	36.00
No. 1 busheling	69.00	to	70.00
Drop forge flashings	43.00	to	44.00
Machine shop turn	45.00	to	46.00
Mixed borings and turn	23.00	to	24.00
Shoveling turnings	46.00	to	47.00
Cast iron borings	36.00	to	37.00
Heavy breakable cast	38.00	to	39.00
Mixed cupola cast	54.00	to	55.00
Automobile cast	77.00	to	78.00
Stainless			
18-8 bundles and solids	445.00	to	455.00
18-8 turnings	350.00	to	360.00
430 bundles and solids	100.00	to	110.00

Youngstown

No. 1 hvy. melting	$ 66.00	to	$ 69.00
No. 2 hvy. melting	47.00	to	50.00
No. 1 dealer bundles	79.00	to	82.00
No. 2 dealer bundles	35.00	to	38.00
Machine shop turn	13.00	to	16.00
Shoveling turnings	18.00	to	21.00
Low phos. plate	79.00	to	82.00
Electric furnace bundles	76.00	to	79.00
Galvanized bundles	67.00	to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00	to	$ 63.00
No. 2 hvy. melting	37.00	to	40.00
No. 1 dealer bundles	68.00	to	71.00
No. 1 factory bundles	72.00	to	75.00
No. 2 bundles	19.00	to	22.00
No. 1 busheling	73.00	to	76.00
Machine shop turn	8.00	to	11.00
Mixed bor. and turn	8.00	to	11.00
Shoveling turnings	10.00	to	13.00
Cast iron borings	13.00	to	16.00
Cut structural & plates, 2 ft. and under	105.00	to	108.00
Low phos. punchings plate	105.00	to	108.00
Drop forge flashings	42.00	to	45.00
Foundry steel, 2 ft. & under	62.00	to	65.00
No. 1 RR hvy melting	79.00	to	82.00
Rails, 2 ft. and under	105.00	to	108.00
Rails, 18 in. and under	108.00	to	111.00
Steel axle turnings	59.00	to	62.00
Railroad cast	92.00	to	95.00
No. 1 machinery cast	102.00	to	105.00
Cupola cast	58.00	to	61.00
Stove plate	44.00	to	47.00
Stainless			
18-8 bundles	375.00	to	385.00
18-8 turnings	325.00	to	335.00
430 bundles	80.00	to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00	to	$ 68.00
No. 2 hvy. melting	56.00	to	57.00
No. 1 busheling	79.00	to	80.00
No. 1 dealer bundles	79.00	to	80.00
No. 2 bundles	37.00	to	38.00
Machine shop turn	14.00	to	15.00
Mixed bor. and turn	13.00	to	14.00
Shoveling turnings	17.00	to	18.00
Cast iron borings	22.00	to	23.00
Low phos. plate	95.00	to	96.00
Structural and plate, 2 ft. and under	96.00	to	97.00
Rails, 2 ft. and under	94.00	to	95.00
Scrap rails, random lgth	74.00	to	75.00
No. 1 machinery cast	79.00	to	80.00
No. 1 cupola cast	59.00	to	60.00

St. Louis

No. 1 hvy. melting	$ 66.00	to	$ 67.00
No. 2 hvy. melting	55.00	to	56.00
Foundry steel, 2 ft.	66.00	to	67.00
No. 1 dealer bundles	86.00	to	87.00
No. 2 bundles	54.00	to	55.00
Machine shop turn	17.00	to	18.00
Shoveling turnings	23.00	to	24.00
Cast iron borings	27.00	to	28.00
No. 1 RR hvy. melting	68.00	to	69.00
Rails, random length	70.00	to	71.00
Rails, 18 in. and under	89.00	to	90.00
RR specialties	85.00	to	86.00
Cupola cast	72.00	to	73.00
Heavy breakable cast	50.00	to	51.00
Stove plate	83.00	to	84.00
Steel car wheels	97.00	to	98.00
Rerolling rails	80.00	to	81.00
Unstripped motor blocks	56.00	to	57.00

Birmingham

No. 1 heavy melting	$ 73.00	to	$ 74.00
No. 2 heavy melting	65.00	to	67.00
No. 1 dealer bundles	73.00	to	74.00
No. 2 bundles	52.00	to	53.00
No. 1 busheling	73.00	to	74.00
Shredder scrap	93.00	to	94.00
Machine shop. turn	26.00	to	27.00
Shoveling turnings	40.00	to	41.00
Cast iron borings	40.00	to	41.00
Electric furnace bundles	64.00	to	65.00
Elec. furnace, 3 ft. & under	71.00	to	72.00
Structural and plate, 2 ft.	97.00	to	98.00
Structural and plate, 4 ft.	87.00	to	88.00
No. 1 RR hvy. melting	87.00	to	88.00
Scrap rails, random lgth	82.00	to	83.00
Rails, 2 ft. and under	102.00	to	103.00
Angles and splice bars	87.00	to	88.00
No. 1 cupola cast	84.00	to	85.00
Unstripped motor blocks	67.00	to	68.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00	to	$ 60.00
No. 2 hvy. melting	55.00	to	56.00
No. 1 dealer bundles	71.00	to	72.00
No. 2 bundles	33.00	to	34.00
Machine shop turn	5.00	to	6.00
Shoveling turnings	7.00	to	8.00
Cast iron borings	20.00	to	21.00
Low phos. 18 in. and under	88.00	to	89.00
Rails, random length	71.00	to	72.00
Rails, 2 ft. and under	87.00	to	88.00
No. 1 cupola cast	60.00	to	61.00
Heavy breakable cast	27.00	to	28.00
Drop broken cast	81.00	to	82.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00	to	$ 52.00
No. 2 hvy. melting	41.00	to	43.00
No. 2 dealer bundles	23.00	to	27.00
Mixed bor. and turn	11.00	to	13.00
Machine shop turn	6.00	to	7.00
Shoveling turnings	14.00	to	15.00
Clean cast. chem. borings	35.00	to	36.00
No. 1 machinery cast	89.00	to	90.00
Mixed yard cast	50.00	to	51.00
Heavy breakable cast	10.00	to	12.00
Stainless			
18-8 prepared solids	490.00	to	510.00
18-8 turnings	390.00	to	410.00
430 prepared solids	90.00	to	110.00
410 solids	80.00	to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00	to	$ 66.00
No. 2 hvy. melting	55.00	to	56.00
No. 1 dealer bundles	70.00	to	71.00
No. 2 bundles	39.00	to	41.00
No. 1 busheling	75.00	to	76.00
Shredder scrap	73.00	to	75.00
Machine shop turn	14.00	to	16.00
Shoveling turnings	20.00	to	22.00
No. 1 machinery cast	85.00	to	90.00
Mixed cupola cast	48.00	to	50.00
Heavy breakable cast	16.00	to	17.00

San Francisco

No. 1 hvy. melting	$ 43.00	to	$ 45.00
No. 2 hvy. melting	37.00	to	39.00
No. 1 dealer bundles	33.00	to	35.00
No. 2 dealer bundles	16.00	to	18.00
Machine shop turn	6.00	to	8.00
Cast iron borings	6.00	to	8.00
No. 1 cupola cast	81.00	to	83.00

Los Angeles

No. 1 hvy. melting	$ 44.00	to	$ 46.00
No. 2 hvy. melting	37.00	to	39.00
No. 1 dealer bundles	34.00	to	36.00
No. 2 dealer bundles	16.00	to	18.00
Machine shop turn	10.00	to	12.00
Shoveling turnings	8.00	to	10.00
Cast iron borings	6.00	to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00	to	79.00
No. 1 cupola cast	75.00	to	77.00

Seattle

No. 1 hvy. melting	$ 70.00	to	$ 72.00
No. 2 hvy. melting	59.00	to	61.00
No. 2 bundles	41.00	to	43.00
No. 1 cupola cast	97.00	to	99.00
Mixed yard cast	84.00	to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	84.00
No. 1 dealer bundles	92.00
No. 2 bundles	48.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	92.00
Bush. new fact. unprp'd.	82.00
Machine shop turn	41.00
Short steel turn	43.00
Mixed bor. and turn	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00	to	$ 74.00
No. 2 hvy. melting	59.00	to	60.00
No. 2 bundles	42.00	to	43.00
Machine shop turn	16.00	to	17.00
Crushed turnings	34.00	to	35.00
Shredder scrap	78.00	to	79.00
Cut structural plate, 2 ft. and under	100.00	to	102.00
Cut structural plate, 5 ft. and under	87.00	to	89.00
Unstripped motor blocks	60.00	to	61.00
Cupola cast	75.00	to	76.00

DURABLE ORDERS SLIP IN JUNE

Another sign the economy is slowing occurred in June, but experts say there's no reason for alarm, yet. Overall new orders for manufactured goods fell 1.4 pct in June following a "healthy uptick" registered the previous month. The drop in the sixth month, however, was the second decline in the three month period, April-June.

Observers point out that after 18 months of recovery, statistical indicators are expected to vary, up and down, but not dramatically so. June new orders for durable goods dropped 2.4 pct to $99.8 billion compared with May's $102.3 billion, the U.S. Commerce Department said. Conversely, the constantly fluctuating defense industries segment of the orders rose 23 pct to $7.0 billion. Defense industries' orders had dropped in May.

Capital goods new orders minus the defense segment dropped 3.1 pct to $28.1 billion versus May's $29.0 billion. The May figure had risen compared with April.

In metalworking the declines in June were dramatic. Total machine tool orders dropped 66 pct to $192.2 million compared with $320 million in May. Within that category, metalforming machine tool orders dropped 117 pct, to $60.4 million versus May's $131.1 million. Metalcutting machine tool orders fell 43 pct, $131.8 million compared to May's $188.5 million.

Primary metal orders were down slightly in June, for the second month in a row. The figure was $10.6 billion in the sixth month, 0.9 pct smaller than May. This marked the sixth decline in the last seven months. Within that category, nonferrous metals dropped 2 pct to $4.9 billion compared with $5.0 billion in May. Steel orders were up, $4.5 billion versus $4.4 billion, a 2 pct rise.

The only major industry category to show improvement was industrial transportation equipment, but that was up only 0.8 pct—$24.0 billion versus $23.8 billion.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	2nd Qtr.	$303.8	$332.7	$302.2
Manufacturing, Total	2nd Qtr.	126.0	124.7	111.3
Manufacturing, Durable Goods	2nd Qtr.	58.3	59.2	50.9
Mining Industry	2nd Qtr.	13.3	13.6	14.6
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	June	99.8	102.3	89.9
Shipments	June	99.2	97.9	85.9
Inventories	June	182.3	180.6	169.6
Unfilled Orders	June	345.3	344.6	305.0
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	June	28.1	29.0	23.3
Capital Goods Producers, Defense Industries	June	7.0	5.7	8.3
Primary Metals, Total	June	10.6	10.7	9.8
Steel (SIC 331)	June	4.5	4.4	3.8
Iron & Steel Castings (SIC 332)	June	1.2	1.3	1.1
Nonferrous Metals	June	4.9	5.0	4.9
Nonelectrical Mach.-Equip. Industries, Total	June	18.5	18.8	14.7
Engines & Turbines	June	1.5	1.0	0.8
Farm Machinery & Equipment (Shipments)	June	0.9	0.9	0.9
Construction, Mining & Mat. Hdlg. Equip.	June	3.0	3.0	2.5
General Industrial Machinery	June	1.5	1.3	1.1
Fluid Power Equipment** (Index-1972=100)	June	300.0	304.0	249.0
Metalworking Machinery	June	0.8	1.0	0.6
Machine Tools, Total ($ Mill., Unadjusted)***	June	192.2	320.0	145.3
Machine Tools, Metalcutting***	June	131.8	188.5	96.5
Machine Tools, Metalforming***	June	60.4	131.1	48.8
Electrical Mach. & Equip. Industries, Total	June	16.1	17.5	13.7
Elec. Transmission Equip. & Ind. Apparatus	June	2.0	1.9	1.9
Household Appliances	June	1.5	1.6	1.2
Communication Equipment	June	5.7	5.6	4.8
Transportation Equip. Industrial, Total	June	24.0	23.8	23.3
Motor Vehicles & Parts (Shipments)	June	15.3	15.6	12.9
Aircraft, Missiles & Parts	June	7.2	6.4	8.4
Shipbuilding & Military Tanks	June	0.9	1.1	1.2
Fabricated Metal Products, Total	June	11.1	11.6	10.3
Instruments, Total	June	4.9	5.1	4.2

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 3, 26-27, 30-31,

33, 35, 37, 39, 41, 43,

45-46, 49-51, 54, 54A4-54A5,

54A8, 70-73, 76.

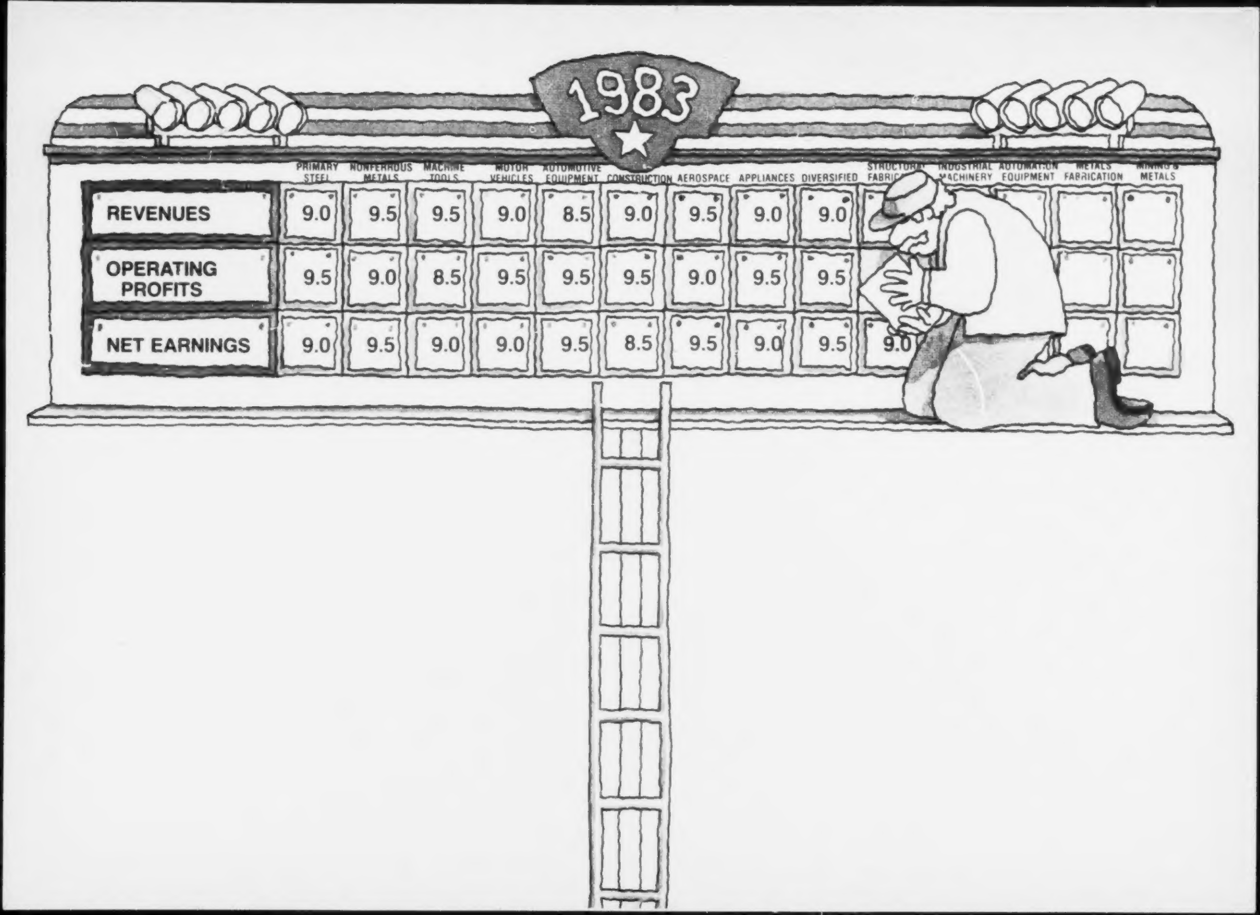
C 2150. 2

CHILTON'S

IRON AGE

METALS PRODUCER

September 3, 1984


1983
PRIMARY STEEL
NONFERROUS METALS
MACHINE TOOLS
MOTOR VEHICLES
AUTOMOTIVE EQUIPMENT
CONSTRUCTION
AEROSPACE
APPLIANCES
DIVERSIFIED
STRUCTURAL FABRIC
INDUSTRIAL MACHINERY
AUTOMATION EQUIPMENT
METALS FABRICATION
MINING & METALS
REVENUES
9.0 9.5 9.5 9.0 8.5 9.0 9.5 9.0 9.0
OPERATING PROFITS
9.5 9.0 8.5 9.5 9.5 9.5 9.0 9.5 9.5
NET EARNINGS
9.0 9.5 9.0 9.0 9.5 8.5 9.5 9.0 9.5 9.0

FIRST ANNUAL

FINANCIAL SCOREBOARD

METALWORKING'S FAST-GROWTH COMPANIES

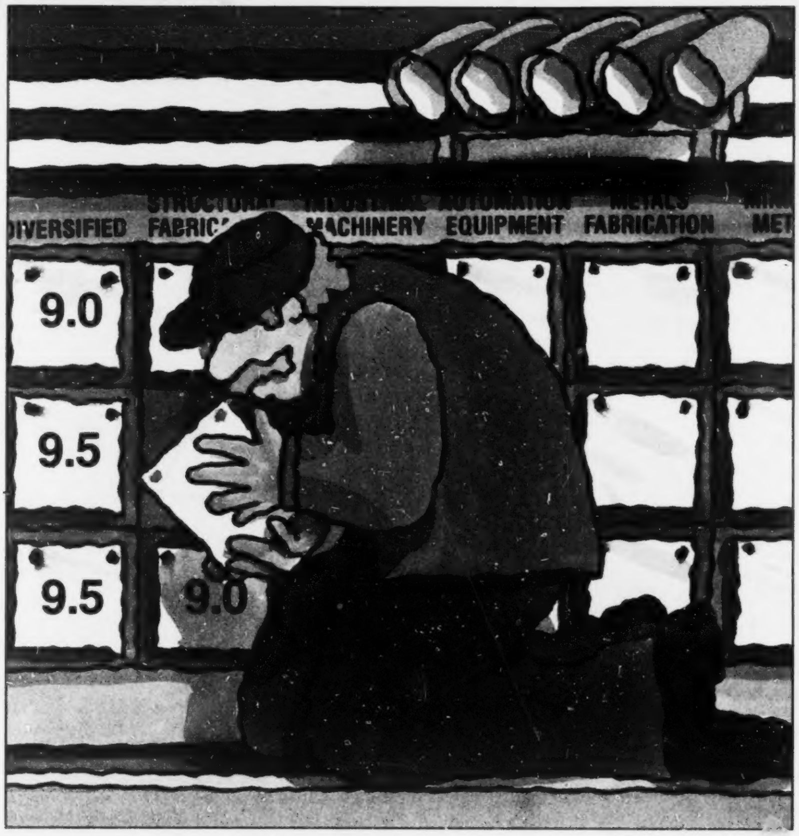
LED FROM POWDER

'S INDUSTRIAL HEART AND SOUL

ANT SPOTLIGHT

SEPTEMBER 3, 1984 VOL. 227, NO. 17

CHILTON'S
IRON AGE
METALS PRODUCER



Editorial 7
Is Uncle Sam letting up on steel?

Newswatch 11
Reynolds may invade Canada's canstock market.

The Hot Spot 17
Domestic competition hurts; R&D saves.

You And Your Job 23
You don't have to fire the poor performer.

Financial Scoreboard 26
Iron Age looks at metalworking's fastest growing companies.

Industrial Heartland 50
The industrial Midwest is at a crossroads of crisis.

Powder Metals 57
The search is on for a method to roll powder into strip.

In Plant Spotlight 61
Mannesmann develops a caster to produce round and square strands.

Materials Report 69
Steel shipments are back where they were a year ago.

Price Trends 76
Inflation returns, but it's a much tamer creature.

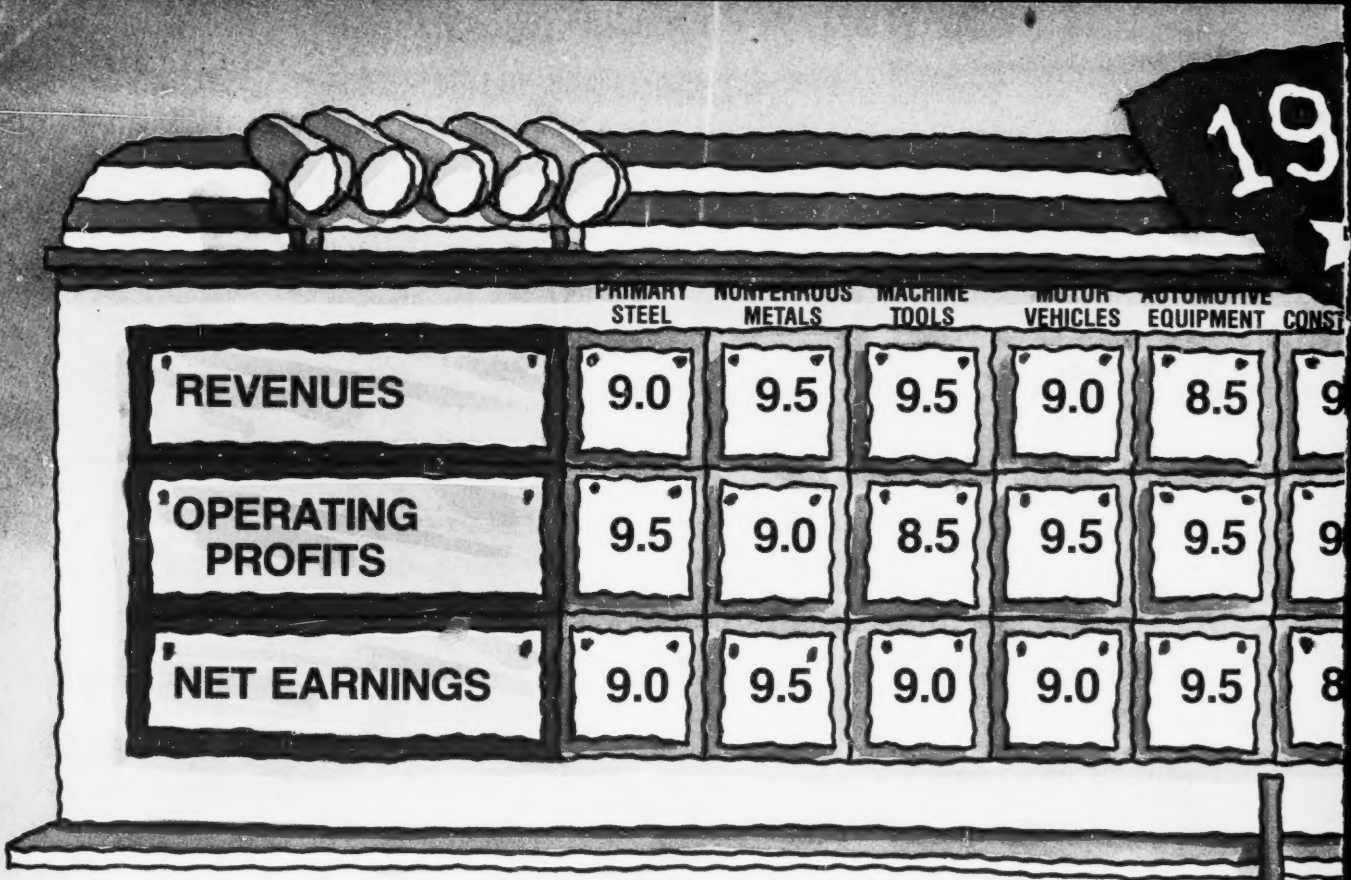
Next Issue: Capital spending makes steel more competitive.

Departments

EDITORIAL STAFF 8
PERSONNEL TOUCH 16
PRODUCT & EQUIPMENT REVIEW 62
AD INDEX 66
MANAGEMENT SERVICE CARD 67
BUSINESS STAFF 68
P&P DATA 8/13 70
FERROUS SCRAP 8/13 71
STEEL PRICES 72
CLEARING HOUSE 74

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

Chilton
abc
ONE OF THE ABC PUBLISHING COMPANIES



	PRIMARY STEEL	NONFERROUS METALS	MACHINE TOOLS	MOTOR VEHICLES	AUTOMOTIVE EQUIPMENT	CONST
REVENUES	9.0	9.5	9.5	9.0	8.5	9
OPERATING PROFITS	9.5	9.0	8.5	9.5	9.5	9
NET EARNINGS	9.0	9.5	9.0	9.0	9.5	8

IRON AGE'S

FIRST ANNUAL FINANCIAL SCOREBOARD

JOHN D. BAXTER

An analysis of the scoreboard data is that well-managed companies in any industry—can grow with the capital and the other resources available to them. This is why stereotype theories on the likely demise of sunset industries are off base.

83
AEROSPACE
APPLIANCES
DIVERSIFIED
STRUCTURAL FABRIC
INDUSTRIAL MACHINERY
AUTOMATION EQUIPMENT
METALS FABRICATION
MINING & METALS
9.5
9.0
9.0
9.0
9.5
9.5
9.5
9.0
9.5
9.0

Iron Age has brought together the U.S. metalworking family for a group portrait.

It is a financial portrait, to be sure, but it reveals much more than just financial facts about about one of the nation's most important industry groups.

The tabulated results give important insights into management effectiveness at individual companies. Too, the results draw a graphic picture of the ravages of sluggish economic times and special problems of the last 5 years.

The data shows that many companies in so-called 'smokestack' industries have displayed considerable strength in the face of much public fretting about mature, 'fading' industries.

Simply, the sun is not setting on all companies in 'sunset' industries—even when measured against the worst of times.

Some 275 companies in 14 different industry groupings are displayed in the *Iron Age* Financial Scoreboard.

Collectively, these companies account for a great share of all manufacturing done in this country. Their products range from state-of-the-art products for the military and the aerospace sectors to mundane metal products used in every home in America.

The *Iron Age* scoreboard is thought to be the only published corporate tabulation that brings together exclusively all of this country's top metals producing and metalworking corporations. It is now planned as an annual feature and the table that follows will be the first of an annual presentation.

The inclusion in the scoreboard of the industry category of Automation Equipment, Factory and Office, may surprise some readers. But many traditional metalworking industry boundries have faded in recent years. For example, a traditional machine tool can be simply listed as such, or, when numerical controls are added, can be listed as automation equipment.

Also, major users of automated equipment, both in the factory and the office, include, in important measure, metals producing and metalworking industries.

It is worth noting, too, that the automation equipment industry itself is a consumer, and a growing one, of many metals and metalworking products.

Focal Points

As noted on the table, companies in each of 14 industry groups, are listed according to their return on invested capital over their five most recent fiscal years. This measure is used because it best offers a full and fair comparison of individual corporate performances.

Return on invested capital shows how much a company earned on both its stockholders' equity and its long-term debt. Thus, it measures how well corporate leaders managed the major financial resources at their disposal. And the 5-year span tends to smooth out cyclical bounces and one-time transactions that can greatly color data over periods of less span.

So, the scoreboard gives both the latest fiscal-year showing of some 275 companies and the five-year record of progress measured against use of stockholders' equity and long-term debt.

In most part, allowing for small differences in individual company fiscal years, the five-year period of this scoreboard measures a period of sluggish business activity for U.S. industry. Two of the years were recession years and two others were of substandard economic growth. The overall U.S. economic growth rate (real GNP) for the five-year period was 2.2 pct. That compares with a U.S. long-term growth rate of 3.5 pct.

In view of the sluggishness of the period measured, some of the returns on capital that were scored by metalworking companies are remarkable. They blow away critics who singularly see basic industries in the U. S. in "a slide to oblivion," as one academician says.

The many companies shown with small, or negative, returns on capital over the past five years, of course, reflect the very sluggish times. To a probable lesser degree, those many corporate financial laggards reflect secular restructuring going on in many U. S. industries.

But a major point that emerges from an analysis of the scoreboard data is that well-managed companies in any industry can grow—and grow strongly—with the capital and other resources available to them. This is why stereotype theories on the likely demise of 'sunset' industries are off base.

Returns on invested capital over five years among leaders in each industry group, range from a high of 24.1 pct —for Schlumberger Ltd in the automation equipment industry group— to 6.1 pct—for John Deere Co. in the farm and construction equipment group.

In view of the fact that the listing represents a cross-section of the industries hardest-hit in the five-year period, this showing is almost certainly stronger than might be popularly expected.

Still, a full reading of the scoreboard reflects the havoc done in a roller-coaster—mostly downslide—span of years. It reflects damage done by super-high interest rates in many capital-intensive industries. And it reflects the damage done—especially to basic manufacturing industries—by tidal-wave imports in recent years.

The industries listed here have been in the dead-center of this storm of sluggish national economic growth, runaway interest rates and intense foreign competition over the last five years.

Of course, a five-year return on invested capital, as important an indicator of corporate financial health as it is, does not tell a full story on any company or industry.

Some companies, for example, are shown with high returns on invested capital but a poor record of operating profits. That state, for one, might indicate non-recurring earnings may have been large over the years. Such earnings could be, or could not be, beyond management's scope of control.

Often times, too, a company may have a strategic plan underway to correct a corporate weakness, or to bolster a special strength. In such a case, some financial measures of corporate success may not show up well. Corporate sacrifices, by strategic design, are made at the cost of a favorable showing in a traditionally important measure of corporate financial success.

The *Iron Age* scoreboard, like all compilations of corporate data, must bear the warning, "Use with caution." It tells a lot, but not everything.

Riding the Storm

No matter how the table is read, there are still some surprises.

Everybody—but everybody—in industry knows, for example, that the steel and machine tool industries have been especially battered in recent years. Yet, at the top of the steel industry list is a company that had a return on invested capital of almost 15 pct over the past five hectic years. That is Nucor Corp.

The leading position of Nucor has a lot to do with the structure of the steel industry and where the company fits in. It is a leading minimill and has escaped many of the problems besetting large, integrated producers.

But still, it is widely known that Nucor has alert, aggressive management. And that is an element that appears in all the leaders on the table.

Too, who would guess that in the machine tool industry over the past rocky years there would be a company with a five-year return on invested capital of 15.8 pct?

That is the record of Monarch Machine Co.

Did Monarch pull off this record because it is a small, limited product-line company?

Perhaps not. Cross & Trecker is an industry giant and it had a five-year return on investment of 15.7 pct—just about the same as for small Monarch.

Both these companies have good reputations for management.

Certainly, John Deere Co.'s reputation for efficient production and product quality helped give it a 6.1 pct five-year return on investment. That, in an industry that has been rocked as about as hard as any.

Some of the highest returns on investment over the past five years were scored in the diversified metalworking industry category shown on the table. Not only were returns high but a relatively great number of companies scored high returns.

There is food for thought for metalworking companies of more restricted diversity. Perhaps there is more efficient utilization of financial resources in diversified companies. In such companies, the lion's share of capital resources tends to flow to the best money-making divisions. Overall, then, diversified companies—as shown on the table—can often get superior returns on their invested capital.

But, in the foggy-bottom world of accounting, as much is often not told in corporate data as is told. There are companies with poor financial showings on the table here that are well-managed. These companies will likely show up near the head of their industry listings in the *Iron Age* 1989 financial scoreboard.

Certainly, it has to be hoped—and rationally expected—that the record over the next five years will be better for all metals producing and metalworking companies listed on the *Iron Age* table. U. S. industry can't take many more five-year periods like the one just past. ☐

PRIMARY STEEL

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Nucor Corp.	542,531	11.6	19,706	1.6	27,864	25.6	13.2	(7.7)	7.3	14.7	18.8	7.1
Carpenter Tech.	397,451	(18.5)	9,192	(78.0)	16,042	(51.6)	2.1	(18.7)	(9.4)	12.2	14.0	7.0
Eastmet Corp.	155,579	(28.0)	(15,844)	(11.3)	(10,231)	(20.7)	0.4	—	—	7.3	(3.1)	(0.9)
Florida Steel	235,108	(5.4)	(4,838)	21.5	(4,677)	43.8	7.7	(11.5)	2.1	6.7	9.2	2.6
Northwestern St.	*167,690	(48.1)	(43,098)	—	(19,162)	(35.2)	(10.1)	(42.6)	(34.1)	5.8	4.4	0.8
Copperweld Corp.	*325,475	(12.6)	(15,023)	—	(22,013)	—	(1.5)	(21.7)	(12.3)	4.5	5.5	1.1
Athlone Inds.	234,107	(3.5)	8,167	20.3	(493)	—	0.7	(7.8)	—	4.3	9.9	1.9
LTV Corp.	*4,577,800	(4.2)	(212,800)	19.7	(180,700)	(16.7)	13.9	(7.5)	(6.5)	3.5	9.9	0.8
Cyclops	1,024,114	17.3	1,941	—	(2,190)	81.6	6.3	(48.0)	29.0	2.6	1.6	0.6
Lukens Inc.	342,855	(12.0)	(2,942)	53.2	(14,012)	—	3.3	8.3	—	1.6	1.2	0.5
Wheeling/Pitts.	831,260	7.2	(34,427)	49.6	(54,080)	8.0	(4.6)	21.1	42.0	1.2	0.2	(0.8)
U.S. Steel	17,523,000	(7.3)	2,763,000	(5.3)	(1,161,000)	—	10.7	41.9	(37.3)	0.5	(1.2)	1.1
Laclede Steel	*190,149	6.7	5,853	—	5,048	—	(0.7)	—	—	(0.0)	(0.4)	(0.1)
Inland Steel	3,046,200	12.8	(26,335)	84.2	(116,900)	1.6	71.8	—	(61.4)	(0.3)	(0.7)	(1.9)
Republic Steel	2,701,107	(1.4)	(121,551)	36.7	(326,494)	(36.5)	(13.5)	(20.9)	(7.7)	(2.1)	(4.8)	(2.4)
Armco	4,164,600	(23.3)	(347,800)	36.0	(672,500)	(94.9)	1.1	(34.0)	(56.8)	(3.0)	(6.2)	(1.7)
Sharon Steel	820,815	*18.5	23,452	—	(68,785)	34.9	13.3	(56.5)	(17.3)	(4.5)	(56.2)	(2.0)
National Intgr.	2,992,703	(1.7)	(16,608)	(93.1)	(154,318)	66.7	(3.4)	(88.7)	—	(4.8)	(8.6)	(2.6)
Keystone	*330,738	(6.0)	(7,707)	29.9	(21,284)	(58.6)	(1.2)	—	—	(5.2)	(8.0)	(2.1)
Bethlehem	4,898,200	(6.9)	(270,400)	45.7	(163,500)	88.9	(3.3)	(34.6)	—	(9.7)	(21.7)	(4.5)
Kaiser Steel[a]	226,984	(42.0)	(17,278)	—	(422,770)	—	(33.6)	(93.7)	—	—	—	(89.8)

NONFERROUS METALS

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Phibro-Salom	*29,757,000	11.4	2,271,000	8.8	470,000	39.5	29.5	41.1	54.8	19.8	26.6	1.9
Newmont Mining	720,912	6.8	(2,571)	(16.5)	52,901	9.0	3.3	(3.6)	89.3	19.3	16.1	2.1
Freeport-McMoran	786,151	5.1	142,832	9.4	93,472	41.7	22.4	32.8	37.2	14.1	20.0	17.3
Cabot Corp	1,558,016	(1.9)	121,721	(31.8)	64,162	(27.1)	21.7	13.3	18.6	12.3	17.8	6.8
Martin Marietta	3,899,258	10.6	6,995	(91.4)	141,331	54.2	17.6	(32.7)	8.6	11.8	18.0	5.6
Brush Wellman	*245,415	26.6	37,053	29.2	25,697	—	15.0	13.7	28.7	11.5	14.4	9.4
Alcan Alum.	4,969,000	14.2	110,000	—	73,000	—	38.1	18.0	24.7	10.6	10.7	5.4
Fluor Corp.	*5,300,452	(21.4)	1,761	(98.9)	27,700	(81.9)	21.5	48.3	(1.1)	10.5	13.1	2.3
Cominco Ltd.	#1,374,723	11.3	186,861	32.6	(39,325)	(26.1)	10.3	(10.3)	(8.4)	7.7	10.4	5.5
Alcoa	5,263,400	13.2	390,700	—	174,200	—	5.8	—	—	7.3	10.2	5.8

NONFERROUS METALS

Companies ranked in order of five year average annual return on invested capital

1983 (Dollars in thousands per company fiscal years) — **Five Year Growth, Pct** (Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Asarco	1,512,236	12.0	36,145	—	58,329	—	7.3	83.6	53.4	7.1	8.8	6.0
Olin Chems.	1,934,600	6.1	9,452	—	71,700	34.5	4.7	—	25.3	5.9	8.2	3.4
Kaiser Alum	*3,013,700	(8.2)	2,100	(98.6)	(74,900)	34.7	2.6	(33.1)	(26.3)	3.6	6.2	15.5
Reynolds	*3,340,800	11.6	(75,800)	—	(99,100)	—	4.2	—	—	3.5	5.5	2.5
Amax Corp.	2,290,100	(5.2)	137,300	28.8	(489,000)	(25.4)	8.8	3.0	(37.6)	3.1	4.8	(1.5)
Phelps-Dodge	977,400	2.0	(47,000)	40.7	(63,500)	14.5	1.6	(27.6)	6.7	1.6	2.5	1.1
Inco Ltd.	1,173,421	(5.1)	(312,784)	(13.9)	(234,894)	(15.5)	(7.2)	51.9	(50.0)	(5.3)	(10.8)	(8.4)

MACHINE TOOLS

Companies ranked in order of five year average annual return on invested capital

1983 (Dollars in thousands per company fiscal years) — **Five Year Growth, Pct** (Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Monarch Machine	*60,659	(36.3)	1,435	(88.1)	509	(92.6)	(0.8)	(7.4)	(0.5)	15.8	15.8	8.1
Cross & Trecker	149,925	(60.6)	(10,903)	—	3,687	(90.5)	(1.4)	(66.2)[a]	1.6	15.7	16.8	7.7
Acme-Cleveland	172,739	(47.2)	(20,469)	—	31,993	—	1.7	(29.4)	36.3	12.6	17.4	6.9
Ex-Cell-O Corp.	953,803	(7.1)	29,308	(5.4)	49,815	3.3	6.5	0.0	6.3	11.4	13.1	5.1
Clausing Corp.	74,812	(8.2)	6,731	(25.8)	4,193	(6.7)	16.5	14.4	16.4	10.8	15.1	5.7
Cinci. Milacron	560,199	(26.4)	(42,138)	—	(10,279)	—	0.7	(70.3)	(36.0)	9.4	12.7	4.7
Gleason Works	163,509	(8.5)	(16,328)	33.9	(7,671)	17.5	(1.9)	—	(45.9)	4.8	5.4	1.9
Brown & Sharpe	131,466	(8.6)	(11,093)	52.4	(1,011)	92.5	1.0	—	(31.7)	2.5	3.1	1.0
Lodge & Shipley	15,394	(47.2)	(4,480)	—	(2,360)	—	(4.5)	(7.0)	(24.6)	1.5	1.8	(1.5)

MOTOR VEHICLES

Companies ranked in order of five year average annual return on invested capital

1983 (Dollars in thousands per company fiscal years) — **Five Year Growth, Pct** (Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Gen. Motors	74,581,600	24.2	8,058,300	—	3,730,200	—	4.9	15.2	84.7	6.4	7.2	2.0
Ford Motor	44,454,600	19.9	3,475,800	—	1,866,900	—	1.4	78.1	38.9	(0.9)	(1.5)	(0.4)
Chrysler	*13,240,400	31.8	1,424,500	—	700,900	—	2.2	32.5	5.8	(11.6)	(96.5)	(5.5)
AMC	*3,271,720	36.7	(102,328)	41.3	(146,730)	4.6	6.2	(27.7)	(30.4)	(14.7)	(39.6)	(1.8)

AUTOMOTIVE EQUIPMENT & PARTS

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Simpson Inds.	*92,308	(27.3)	(4,331)	—	317	(94.3)	(3.8)	4.9	(10.5)	10.5	12.5	3.6
Hoover Universal	776,900	32.5	48,287	—	32,400	—	8.5	36.2	10.2	9.7	13.9	3.8
Eaton	*2,674,125	9.0	186,003	—	93,311	—	(0.1)	6.0	(43.5)	9.1	4.4	1.4
Echlin Inc.	564,497	15.1	43,624	13.7	30,732	15.8	15.9	27.2	25.9	8.4	10.8	4.9
Dana	2,874,118	17.8	172,138	—	112,803	—	5.8	20.2	12.9	8.1	10.8	4.0
Barnes Group	*442,137	7.4	21,918	92.1	(2,599)	5.2	5.9	—	(35.5)	6.4	7.4	2.5
Arvin Inds.	600,605	16.9	17,441	—	18,338	68.8	4.8	24.6	9.1	5.4	7.8	2.7
Allen Group	352,437	11.8	9,952	—	6,164	—	3.7	27.0	(15.8)	3.5	3.0	1.2
Sheller-Globe	608,451	21.3	17,956	58.7	16,612	17.8	4.2	—	(92.5)	3.1	4.9	1.4
Fruehauf Corp.	2,129,375	15.0	114,758	—	8,382	—	0.2	60.6	(39.3)	2.6	4.5	1.0
A.O. Smith	853,372	22.9	3,997	—	13,628	—	2.2	—	17.0	1.9	2.1	0.5
Hayes-Albion	141,824	(7.9)	(9,719)	45.5	(10,846)	(63.9)	(7.2)	—	—	(15.6)	(10.2)	3.2

FARM & CONSTRUCTION MACHINERY

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Deere	4,017,481	(14.0)	61,696	(56.7)	23,285	(56.0)	0.2	(18.9)	(26.8)	6.1	8.0	3.3
Caterpillar	5,424,000	(16.2)	(310,000)	(22.5)	(345,000)	(91.7)	(4.1)	(31.6)	(43.7)	5.5	4.8	2.0
American Hoist	319,774	(31.5)	(28,182)	(94.9)	(44,215)	—	(4.6)	(36.5)	(53.9)	2.2	(2.8)	(1.4)
Hesston	197,962	(22.1)	21,249	(37.8)	2,028	(74.5)	0.3	49.4	—	1.0	1.1	0.4
Clark Equip.	862,247	(15.5)	(36,492)	44.9	12,414	—	(9.6)	(77.1)	—	(0.0)	(0.5)	(0.4)
Bucyrus-Erie	551,533	(19.8)	(14,508)	—	(133,003)	—	2.8	(14.3)	—	(1.8)	(1.9)	1.2
Massey-Ferg.	1,535,000	(25.4)	28,700	—	(68,000)	83.5	(9.0)	(50.8)	—	(15.8)	(57.9)	(7.6)
Barber-Greene	115,745	(26.1)	(17,356)	—	(34,948)	—	(8.0)	—	—	(20.6)	(23.6)	(4.6)
IH	*3,569,621	(16.5)	(263,859)	50.4	(485,285)	72.1	(9.8)	50.1	(76.4)	(22.6)	—	(11.8)

AEROSPACE

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Gulfstream	586,312	0.7	107,312	7.3	53,134	23.6	28.7	34.2	67.9	18.3	35.0	5.9
Boeing	11,129,000	23.2	(5,000)	95.0	355,000	21.6	16.8	7.2	7.5	17.4	18.6	4.8
General Dyn.	*7,146,000	16.1	329,100	—	286,600	—	20.0	—	—	16.6	17.1	3.7
United Aircraft	28,887	8.1	4,996	9.2	3,231	6.7	13.8	44.5	23.4	15.9	15.9	10.0

AEROSPACE

Companies ranked in order of five year average annual return on invested capital

1983
(Dollars in thousands per company fiscal years)

Five Year Growth, Pct
(Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Curtis-Wright	189,281	(2.2)	17,060	(2.2)	18,503	(11.1)	2.3	9.7	27.6	14.5	17.4	18.0
Rockwell	8,097,900	9.5	345,300	30.4	389,100	17.3	8.9	5.5	18.0	14.1	16.4	4.4
Fairchild	895,788	(18.8)	56,680	(26.4)	28,405	(19.4)	10.3	2.0	10.9	12.4	15.8	4.6
Northrop	3,260,600	31.9	30,700	—	100,700	—	13.5	(25.9)	—	12.3	13.5	3.3
McDonnell D.	8,292,800	11.3	535,300	23.7	274,900	28.0	14.6	10.1	13.6	11.4	12.0	2.9
United Tech	14,669,265	8.0	1,514,661	9.9	509,173	(4.6)	19.8	14.0	5.7	10.9	14.1	3.5
Gates Lrjet	*350,507	(36.1)	9,279	(81.4)	449	(96.9)	8.9	(9.5)	(5.0)	10.4	13.5	3.0
Rohr Inds.	569,134	0.6	66,708	29.6	24,125	30.5	17.4	69.6	—	8.9	14.7	3.1
Grumman.	2,254,778	9.6	161,823	(7.6)	110,746	—	10.4	31.3	64.1	7.7	10.8	4.8
Cessna Air.	524,395	(36.9)	(65,311)	—	(18,845)	—	(4.5)	—	(33.7)	6.5	8.7	2.4
Aeronca	*43,852	(0.7)	3,987	(0.3)	3,795	—	0.7	(56.1)	—	4.0	8.4	3.3
Lockheed	6,490,300	(15.6)	415,200	15.3	262,800	26.8	9.4	—[a]	—	2.9	(20.4)	0.9

APPLIANCES

Companies ranked in order of five year average annual return on invested capital

1983
(Dollars in thousands per company fiscal years)

Five Year Growth, Pct
(Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Maytag	598,287	35.4	96,536	89.7	60,691	63.6	13.7	15.2	14.0	19.6[a]	21.3	10.0
Whirlpool	2,667,682	17.5	222,494	59.0	167,038	20.2	5.8	9.5	11.5	14.8	17.1	5.4
Magic Chef	754,399	13.7	27,903	—	25,443	—	19.4	—	88.0	6.4	10.3	1.9
Roper Corp.	*481,143	12.1	24,432	55.2	11,452	—	2.5	—	11.5	5.7	9.1	1.9
Rangaire	*87,031	(9.6)	(2,451)	—	2,818	—	3.4	—	10.3	5.0	7.3	2.2
Fedders[a]	80,780	(6.0)	3,986	—	18,466	—	(2.1)	—	—	—[a]	(94.0)	(22.6)

DIVERSIFIED METALWORKING

Companies ranked in order of five year average annual return on invested capital

1983
(Dollars in thousands per company fiscal years)

Five Year Growth, Pct
(Average annual growth over five latest fiscal years)

Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Unit. Ind.	288,271	12.1	21,839	18.0	16,739	20.2	18.2	19.9	21.4	19.0	19.9	5.4
Emerson Elec.	*3,475,709	(0.8)	433,303	(3.5)	302,927	0.9	7.9	(1.2)	10.3	17.0	19.0	8.1
Core Ind.	130,016	(16.5)	13,952	(31.6)	7,371	(26.9)	2.1	(3.5)	1.9	14.8	15.8	7.3
Trin. Ind.	477,017	(31.4)	10,941	(80.4)	16,501	(57.7)	21.6	27.3	28.8	14.4	20.3	4.9

DIVERSIFIED METALWORKING

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Vulcan	820,519	14.1	9,490	(49.6)	54,182	(0.9)	5.1	14.5	3.0	13.5	16.9	8.4
Emhart	1,685,600	(1.4)	144,800	2.0	84,300	5.1	5.0	1.5	4.6	13.2	15.3	4.2
Worth. Ind. U.S.	449,571	2.7	32,901	1.8	19,870	3.7	20.5	4.0	14.4	12.7	21.5	5.2
Gen. Signal	1,574,948	(2.9)	112,637	(21.0)	89,698	(16.8)	4.4	(0.7)	9.6	12.7	14.1	6.5
Sealed Pow.	424,622	(16.0)	40,742	40.7	29,050	27.2	12.1	26.5	27.1	12.5	14.4	6.8
Lear Sieg.	1,464,190	(1.6)	127,527	7.3	64,122	(11.3)	5.0	7.5	6.9	12.4	17.6	4.7
Whittaker	1,602,825	(4.2)	102,669	(16.7)	37,609	(35.9)	13.4	21.2	8.0	12.1	17.6	3.6
Sundstrand	909,318	(5.4)	29	(50.3)	44,240	(36.2)	6.9	(4.2)	2.3	12.1	16.5	7.5
Cooper Ind.	1,850,280	(22.7)	168,911	(40.9)	71,169	(47.3)	13.5	8.7	27.3	11.7	14.3	7.1
Northwest	*1,608,100	(19.2)	7,900	—	(80,400)	—	2.7	(33.0)	(17.1)	11.3	17.4	7.5
Borg-Warner	3,559,500	10.7	271,700	31.0	182,600	9.1	10.1	6.4	9.5	11.0	12.8	5.1
Morrison-Knud.	2,165,987	(8.3)	50,868	(11.1)	41,512	5.7	21.0	12.6	14.6	10.8	13.9	1.8
TRW	5,557,591	6.9	238,700	2.7	205,160	4.5	8.0	(3.0)	3.8	10.7	14.9	4.0
Fed. Mogul	746,984	1.6	39,885	6.7	41,068	44.5	6.2	(4.5)	5.5	10.0	14.2	5.0
Duriron	124,878	(7.5)	1,642	(73.5)	3,020	(38.6)	7.5	5.4	19.6	9.9	12.0	5.5
KDI Corp.	*201,512	6.6	12,421	74.3	6,797	43.8	3.1	13.3	6.1	9.9	23.8	2.8
Westinghouse	9,532,600	(2.2)	477,800	(8.8)	449,000	(0.1)	7.2	14.6	—	9.6	11.1	3.5
Ceco Corp.	465,178	3.2	13,423	27.4	11,750	9.2	6.7	11.3	5.9	9.6	10.8	3.0
Harsco Corp.	839,085	(14.3)	4,550	—	27,586	(23.6)	1.5	(34.6)	(6.7)	9.4	12.3	4.5
Signal Co.	*6,265,000	62.2	166,000	(59.2)	103,000	(8.8)	13.8	26.8	(3.1)	8.9	10.8	4.8
Katy Ind.	402,554	13.0	26,083	(6.9)	13,045	(5.6)	16.4	13.4	6.7	8.5	12.3	6.0
Ogden Corp.	*1,743,039	(3.7)	328,635	7.8	52,977	(9.4)	(0.5)	(0.4)	0.6	8.4	13.9	3.1
Park-Ohio Ind.	142,030	(19.6)	(7,570)	—	(5,530)	—	(1.0)	(41.8)	(29.1)	8.3	10.4	4.3
Textron Inc.	2,979,800	1.5	88,800	15.2	88,700	5.1	0.8	20.0	(2.3)	8.1	9.8	3.7
Timken Co.	937,320	(7.6)	(69,436)	15.3	530	—	(1.9)	(27.8)	6.0	7.5	7.7	4.4
Figgie Int. Hold.	680,583	(6.8)	32,829	(20.5)	21,355	(18.0)	1.7	2.4	7.7	7.5	13.0	3.0
Eagle-Picher	532,653	0.2	10,156	(14.5)	15,368	34.7	0.9	(21.4)	(7.4)	6.9	23.1	3.4
Franklin Elec.	168,495	22.1	3,284	—	5,524	—	5.5	73.5	98.0	6.0	8.0	2.6
Interlake Inc.	835,041	8.8	21,372	—	22,834	—	(0.8)	23.2	—	5.5	7.6	2.6
AMF Inc.	970,579	(7.9)	7,500	(87.4)	(1,494)	—	3.5	(17.1)	(33.4)	5.4	7.0	3.2
Allegheny I.	2,347,858	(17.3)	83,126	(38.0)	28,305	(40.1)	32.3	20.7	15.0	5.1	8.6	4.2
Salem Corp.	*55,064	(38.1)	(5,623)	—	(2,172)	—	1.8	(43.5)	(53.5)	3.7	3.9	0.8
Koppers	*1,565,670	(1.2)	89,677	12.7	30,588	—	0.4	(6.6)	(4.9)	3.1	5.5	5.5
Dravo Corp.	*823,010	(24.9)	(41,769)	(44.1)	(14,363)	—	(0.8)	—	(75.8)	2.4	3.8	0.8
Valley Ind.	*156,088	(11.1)	(13,343)	4.5	(6,495)	2.9	6.4	43.6	28.0	2.4	3.2	1.0
Chromalloy	*867,867	(7.4)	186,818	11.1	(42,223)	(0.4)	2.7	17.1	—	0.0	(1.0)	0.1
Condec Corp.	*250,954	(6.5)	(13,903)	—	2,180	—	1.8	—	(43.1)	(0.7)	(1.7)	(0.5)
NFV Corp.	999,737	23.3	26,521	—	(53,784)	41.8	13.32	(39.7)	(88.3)	(10.7)	(16.5)	5.9

METALS FABRICATION & METAL PARTS

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Keystone I.	*110,489	(15.1)	CNC	CNC	12,589	(26.0)	6.6	(8.4)[a]	6.9	21.5	21.8	13.6
Raytheon	5,937,264	7.1	388,861	(0.2)	300,147	(5.8)	13.5	55.0	17.0	19.7	20.9	5.5
Snap-on-Tools	*454,748	5.6	95,290	14.4	42,974	15.2	8.3	10.4	7.0	17.2	19.5	9.7
Teledyne	2,979,000	4.1	182,600	(24.3)	304,600	2.7	4.4	(6.6)	6.9	16.2	20.9	11.9
Wyman-Gordon	383,466	(18.9)	57,253	(38.3)	46,692	(17.2)	3.3	14.9	19.0	15.3	17.3	8.7
Ill. Tool Wks.	497,821	11.4	44,117	11.8	49,588	23.7	7.9	2.0	8.4	15.2	15.5	10.0
Baldor Elec.	148,661	(0.9)	8,161	(20.2)	7,756	(8.9)	4.7	(9.7)	(1.0)	13.3	0.6	6.3
Sargent Inds.	98,355	5.2	13,683	4.8	7,742	8.6	85.8[a]	76.7[a]	—	12.9	25.8	9.8
Cameron Iron	955,864	16.7	66,184	(74.6)	3,335	(97.8)	17.2	13.0	7.9	12.3	17.3	9.5
Kennametal	270,693	(30.6)	41,248	(66.4)	(11,204)	—	7.4	(0.7)	(19.0)	11.8	13.0	7.3
Stanadyne	374,662	9.2	51,810	63.5	22,052	58.6	2.5	17.1	17.3	11.7	13.9	4.8
Vermont Amer.	191,444	5.3	14,080	—	14,100	—	29.2	55.1	24.0	11.7	13.7	5.7
Commercial Met.	857,152	(20.4)	6,825	(35.8)	8,087	(15.1)	8.0	(22.6)	24.3	11.3	12.8	1.1
Hi-Shear Ind.	*70,847	(29.0)	3,274	(74.7)	9,437	—	11.5	(20.4)	(12.8)	10.9	10.2	5.9
New Hamp. Ball	55,224	(9.0)	9,081	(22.6)	4,072	(13.5)	14.2	17.9	13.9	10.8	14.4	7.2
Jamesbury	83,880	(22.1)	989	(91.0)	1,328	(73.6)	7.3	4.4	(10.2)	10.4	14.5	5.6
Masco	1,059,450	23.8	138,930	30.1	106,560	15.6	13.1	7.8	12.3	10.4	17.7	10.2
Precision Casts	86,639	(6.4)	6,128	(38.2)	4,836	1.2	19.0	22.3	28.0	10.4	17.2	4.7
Commercial Shear	168,710	(15.4)	38,445	(36.6)	3,337	(54.0)	(3.5)	(91.7)	(24.1)	10.2	22.8	4.9
Regal-Beloit	43,894	17.2	3,145	—	2,510	71.4	12.0	17.8	15.2	10.1	14.7	6.1
Black & Deck.	*1,167,752	0.6	39,808	9.0	44,151	—	7.9	(2.6)	(48.8)	10.0	6.9	3.6
Axia	221,932	9.1	9,261	—	4,836	12.8	0.3	—	(3.1)	9.9	12.4	5.2
SPS Tech	*212,092	(9.7)	7,461	22.5	3,532	—	4.3	15.9	—	9.5	12.6	4.4
NL Inds.	*1,390,100	(35.0)	(143,175)	—	(107,402)	—	1.3	(39.6)	(5.8)	8.8	16.8	9.5
Fleetwood	858,025	47.6	45,996	—	29,740	—	10.2	—	—	7.9	7.9	1.4
Stewart-Warner	265,120	(5.7)	2,027	(71.4)	5,293	(23.7)	(4.1)	(37.5)	(21.7)	7.8	8.0	4.1
Easco	*492,620	15.7	10,674	(35.9)	9,376	(12.8)	10.1	1.2	28.6	6.7	11.0	2.2
Moog	167,091	6.4	18,565	1.4	963	(86.1)	17.2	14.7	3.8	6.4	12.1	4.7
Champion Home	274,693	8.2	1,859	52.3	4,847	(30.6)	2.5	39.9	—	5.8	4.7	0.6
Scovill	742,572	7.4	41,909	(7.0)	27,379	37.3	0.0	(4.0)	87.5	5.7	9.4	2.6
Outboard Marine	788,501	1.3	(41,370)	16.6	39,266	15.5	2.6	2.9	—	5.6	6.6	3.1
Anadite	43,634	(30.2)	(5,438)	—	964	—	1.9	(50.9)	—	5.5	31.4	2.0
Quanex Corp.	297,369	(14.7)	(1,630)	(97.2)	3,514	(89.8)	13.1	8.5	(35.6)	5.4	4.2	1.7
Bundy	155,944	3.0	CNC	CNC	3,071	(8.8)	5.0	46.5[a]	—	5.0	6.9	2.7
Elco Inds.	71,783	(6.1)	13	(98.5)	1,232	(19.7)	1.5	(47.4)	(12.1)	4.8	6.7	4.8
Chicago Rivet	26,549	6.0	289	—	805	—	(5.2)	—	—	4.3	2.8	2.3
Nortek	331,321	68.3	19,508	—	7,200	38.5	36.6	—	30.9	3.9	8.0	2.6
Fischer & Porter	165,193	(9.5)	15,546	(6.7)	583	(19.1)	2.6	47.8	15.7	0.7	1.2	0.3
National Stand.	230,045	(7.0)	(9,402)	57.7	(955)	91.7	(3.9)	(76.2)	—	0.5	0.7	0.2
Toro	240,966	18.3	1,476	1.1	572	—	6.8	(49.3)	(44.5)	0.1	(0.5)	(0.6)
Chicago Pn	*360,956	(3.2)	8,007	—	(15,507)	(29.2)	(0.2)	65.4	(87.7)	(0.2)	(0.2)	0.0
Coachmen I.	*478,742	80.4	41,095	—	23,388	—	20.5	—	—	(0.2)	(0.2)	(0.7)

METALS FABRICATION & METAL PARTS

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
GF Bus. Equip.	*136,330	(15.7)	(5,196)	(71.6)	(2,101)	(64.9)	(1.8)	(70.6)	14.3	(0.2)	(0.6)	(0.2)
Acme-Precision	*26,652	—	529	—	155	67.8	—	55.7	28.3	(1.8)	(1.3)	5.0
Amcast Ind.	174,529	30.2	2,414	—	5,322	—	6.2	59.3	—	(1.9)	(3.5)	(0.9)
RB&W	*137,894	21.0	4,357	—	1,765	—	2.4	—	(73.2)	(2.6)	(9.2)	(1.3)
Lamson & Sess	*99,554	(1.4)	(11,270)	37.5	(44,061)	—	6.3	(94.3)	(67.3)	(27.6)	—	(15.8)

GENERAL INDUSTRIAL MACHINERY

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Briggs & Stratton	613,807	(3.4)	38,596	(27.3)	31,762	(19.3)	7.6	5.8	5.3	16.5	16.5	6.1
Newcor	71,131	3.9	4,940	(27.8)	2,845	(24.8)	10.7	11.4	12.2	15.7	19.1	4.7
Gorman-Rupp	66,453	9.7	8,097	36.9	5,426	26.4	4.3	1.0	3.5	15.6	15.6	8.5
Goulds Pump	275,344	(1.6)	16,573	(40.7)	14,404	(28.3)	6.6	(14.7)	(0.1)	15.1	19.7	7.4
Combustion	3,091,936	(13.4)	(59,023)	—	(20,375)	—	6.8	(36.2)	(4.2)	12.7	15.3	(9.8)
Zurn Inds.	382,193	(5.8)	25,927	(18.3)	19,873	(7.6)	8.1	7.4	13.9	12.0	16.0	4.9
Amsted	490,166	(20.7)	(12,142)	—	(3,800)	—	(5.2)	(46.4)	(35.1)	11.6	7.5	4.7
Joy Mfg.	*627,960	(37.4)	25,719	(82.6)	2,923	(96.5)	2.7	89.1	(3.1)	10.4	12.1	6.3
Parker-Hannifin	1,038,289	(9.6)	27,353	(60.7)	29,487	(48.9)	9.0	(10.7)	(1.8)	10.1	13.8	5.0
FMC Corp.	3,498,162	(0.0)	149,149	(18.9)	168,784	10.8	5.6	(13.0)	6.7	9.6	11.7	4.6
Oilgear	29,022	(14.6)	365	(78.1)	1,066	(36.4)	3.3	(10.5)	(3.0)	9.2	9.8	5.7
Foster Wheeler	1,540,853	(5.3)	45,357	(29.2)	44,213	(22.7)	1.0	(1.8)	3.0	8.7	18.0	3.4
Twin Discs	90,394	(58.3)	11,928	—	(3,624)	—	(3.9)	(24.3)	(27.9)	7.7	9.5	3.2
Prab Robot	*19,104	(1.9)	(177)	—	(56)	—	24.0	(34.9)[a]	55.5	7.5	9.3	2.4
Pa. Eng.	139,683	(20.1)	CNC	CNC	5,531	(32.2)	5.1	CNC	6.5	7.3	13.4	3.8
White Con	2,080,491	3.8	78,188	60.9	51,783	63.0	5.0	2.8	7.4	7.1	10.7	2.7
Rexnord	*804,513	(14.1)	(2,893)	—	3,927	(45.1)	(0.8)	(49.4)	(30.6)	5.7	7.7	2.8
Ing. Rand	2,274,075	(18.0)	(35,604)	—	(112,166)	—	0.8	(35.6)	(73.3)	5.2	7.2	2.8
Colt Inc.	1,576,183	4.3	132,989	34.7	99,255	—	(1.8)	7.8	(11.6)	5.0	21.0	6.6
ACF Ind.	583,789	(26.2)	83,953	(42.3)	1,846	(94.4)	(5.3)	(9.4)	(21.8)	4.7	9.3	3.7
Portec	112,109	(29.0)	(7,276)	—	(3,818)	—	(7.6)	(64.1)	(95.0)	4.6	6.2	1.4
GATX	869,000	(11.8)	(200)	—	(93,100)	—	(2.1)	(15.0)	73.1	4.4	4.8	2.7
Cummins Eng.	1,604,723	1.1	(3,952)	94.0	5,160	(33.0)	2.0	69.5	—	4.3	6.7	1.8
Crane Co.	*771,679	1.1	25,595	—	(109,060)	—	(8.6)	(49.1)	—	(0.6)	(1.1)	0.3
Wean United	121,296	(32.2)	(26,710)	9.7	(24,567)	—	(5.6)	—	—	(8.8)	(18.2)	(4.8)
Allis Ch.	*1,300,327	(19.2)	(54,676)	57.4	(133,232)	35.6	(5.0)	(78.9)	—	(8.9)	(15.8)	(3.6)
Harnischfg.	324,121	(28.4)	(36,610)	13.5	(34,630)	54.8	(5.4)	2.0	96.5	(10.5)	(14.1)	(4.5)
Selas Corp.	22,483	(52.0)	(2,379)	38.1	(2,114)	—	(13.1)	(78.7)	—	(16.8)	(17.9)	(2.9)
Fared Robot[b]	9,942	—	(2,798)	—	(2,978)	—	—	—	—	(62.6)	—	—

HEAVY STRUCTURAL FABRICATION

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Todd Shipyards	788,181	10.1	90,563	(2.5)	30,170	(4.8)	26.1	36.5	—	19.3	33.7	3.8
CBI Inds.	828,173	(31.6)	(21,426)	—	44,110	(50.0)	13.4	7.1	4.1	17.1	17.7	7.5
Am. Shipbldg.	84,211	33.7	(9,456)	—	(9,595)	—	(6.4)	—[a]	7.8	11.4	8.1	1.8
McDermott	*3,707,767	(23.4)	179,077	(56.4)	55,664	(69.7)	33.5	18.8	14.4	6.6	9.4	2.6
Ampco-Pitts.	*244,415	(22.4)	(5,019)	—	(1,686)	69.1	21.1	(43.3)	(1.4)	4.1	7.0	(12.2)
Richmond Tank	22,330	(76.3)	CNC	CNC	(33,756)	—	(2.1)	36.4[a]	(66.1)	(12.2)	(8.8)	30.6

MINING & METALS PROCESSING

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Homestake	247,922	32.0	35,498	—	40,036	—	12.9	—	36.7	18.6	17.8	18.9
Englehard	2,099,337	4.0	67,740	42.7	73,519	13.4	19.6	9.3[a]	12.5	15.4	17.1	2.9
Handy & Harm.	575,900	15.4	24,476	17.4	10,610	27.0	6.6	6.6	11.0	9.6	14.7	2.8
Cleveland Cl.	310,666	15.5	(34,076)	13.2	2,757	—	4.4	(23.7)	(9.7)	6.3	6.5	5.6
Hanna Mining	153,636	7.3	(4,233)	62.8	(28,837)	64.1	(10.0)	(75.9)	15.9	1.0	1.0	(7.0)

AUTOMATION EQUIPMENT, FACTORY & OFFICE

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	Revenues	Pct. Change From 1982	Operating Profits	Pct. Change From 1982	Net Earnings	Pct. Change From 1982	Revenues	Operating Profits	Net Earnings	Return on Invested Capital	Return on Equity	Return on Sales
Schlumberg.	5,513,246	(8.5)	877,585	(36.8)	1,084,299	(19.6)	17.4	10.6	19.3	24.1	26.5	20.6
Computervis.	*400,032	23.0	65,835	10.8	35,340	9.1	56.6	52.4	55.2	19.7	21.9	11.1
IBM	*40,180,000	16.9	6,227,000	19.6	5,485,000	24.4	13.8	12.6	12.5	18.9	21.3	13.0
Intergraph	*252,014	61.9	102,805	75.6	29,342	—	66.4	—[a]	86.2	18.2	25.2	9.1
Litton	4,719,206	(4.5)	311,807	(29.0)	231,560	(26.5)	5.5	10.9	81.5	17.6	19.7	5.8
3M	7,039,000	6.6	733,000	6.9	667,000	5.7	8.7	(1.0)	3.6	17.6	19.4	10.4
Rolm	502,642	32.1	72,865	13.1	35,543	19.2	62.2	58.8	70.6	17.5	24.7	8.4
GE	26,797,000	1.1	2,549,000	6.0	2,024,000	11.4	6.6	5.5	10.5	16.5	18.3	6.6
Auto. Switch	160,207	1.5	25,343	(4.4)	17,166	2.5	8.3	4.0	4.5	15.8	15.8	11.7
Genl. Instr.	974,317	1.8	141,810	21.4	102,181	13.5	14.5	38.6	33.6	14.6	16.6	4.5
E-Systems	826,819	9.6	71,728	33.3	55,246	54.4	19.8	—	41.4	14.5	16.6	4.7
Square D	*1,144,137	8.2	88,335	(10.3)	62,911	(12.3)	10.0	(3.0)	0.9	14.5	18.4	7.7
Ametek	448,152	5.6	53,717	13.7	37,753	38.5	7.3	2.9	15.2	13.7	18.8	6.4
Sanders Assoc.	578,128	32.5	33,766	10.0	39,046	47.8	33.5	24.5	17.1	13.7	16.1	7.0
H-P	*4,710,000	12.4	1,801,000	14.5	432,000	12.8	22.3	22.5	23.3	13.6	13.8	8.8

AUTOMATION EQUIPMENT, FACTORY & OFFICE

Companies ranked in order of five year average annual return on invested capital

	1983 (Dollars in thousands per company fiscal years)						Five Year Growth, Pct (Average annual growth over five latest fiscal years)					
Company	**Revenues**	**Pct. Change From 1982**	**Operating Profits**	**Pct. Change From 1982**	**Net Earnings**	**Pct. Change From 1982**	**Revenues**	**Operating Profits**	**Net Earnings**	**Return on Invested Capital**	**Return on Equity**	**Return on Sales**
Cognitronics	13,603	15.9	1,746	33.9	895	—	19.5	—	80.9	13.0	13.3	6.1
Esterline	201,748	(2.8)	11,353	(33.5)	7,685	(27.8)	4.4	(0.7)	11.7	12.6	18.0	6.3
Perkin-Elmer	1,015,402	(2.1)	316,442	(7.1)	50,242	(19.9)	13.0	12.1	14.0	12.3	14.5	6.2
Wang	1,538,000	32.7	224,700	33.3	152,000	41.9	51.4	48.8	58.9	12.0	20.6	9.3
NCR	3,730,951	5.8	488,949	21.1	287,665	22.7	7.5	10.0	9.4	11.5	13.6	7.2
Digital	4,271,854	10.1	632,106	(19.2)	283,622	(32.0)	24.7	18.5	18.5	11.4	13.0	9.7
Gerber Sci.	117,247	2.2	15,132	27.8	4,517	33.9	36.2	52.0	39.4	11.1	19.6	6.5
Harris	*1,423,653	9.4	(14,278)	—	55,900	(26.0)	14.6	(24.2)	2.8	11.1	15.2	7.3
Paradyne	*208,959	0.8	(16,123)	—	3,652	(86.4)	44.9	(19.8)	40.5	10.9	11.8	12.2
Motorola	4,328,000	14.3	333,000	28.1	244,000	37.1	13.2	6.4	13.3	10.6	13.3	5.4
Ransburg	*131,278	(1.1)	(1,097)	—	756	(87.2)	19.1	(31.5)	(15.7)	10.5	11.8	6.6
Datapoint	540,192	6.2	169,438	6.2	8,077	—	28.1	50.3	56.8	10.4	11.6	6.8
Honeywell	4,864,800	5.9	29,600	(12.7)	231,200	(15.3)	11.6	—	4.3	10.0	12.8	6.2
Foxboro	533,102	(11.7)	31,620	(62.9)	7,977	(77.1)	6.8	(5.7)	(12.0)	9.4	10.1	5.5
Control Data	3,507,900	6.3	415,200	24.1	161,700	4.3	13.9	31.1	13.7	9.2	10.0	5.1
North Am Prec.	*3,799,825	19.9	128,236	43.4	95,712	30.1	5.9	5.3	10.3	8.7	12.1	3.2
CTS	*306,153	19.1	1,558	89.5	9,145	(2.4)	13.3	5.6	(0.7)	8.6	8.8	4.5
Sperry	5,076,000	(8.9)	1,283,700	(16.2)	118,100	(46.8)	7.2	27.9	(2.5)	8.6	11.0	4.6
Genrad	*226,611	20.5	48,688	63.7	19,630	—	21.0	25.7	—	8.6	10.5	5.3
Gould	*1,324,800	5.8	139,700	(3.17)	64,100	(30.9)	15.4	—	(7.2)	7.9	11.1	8.7
Mohawk Data	*363,624	8.9	11,150	(27.8)	12,045	(23.0)	19.6	16.0	3.4	7.9	13.9	5.4
ITT	14,155,408	(7.1)	957,210	4.3	674,510	1.8	(1.1)	10.1	17.1	7.5	10.0	3.8
Data General	828,904	2.9	65,389	(6.3)	23,135	(6.2)	17.5	(14.7)	(6.3)	7.2	9.8	6.2
Coherent	*91,303	13.6	9,939	—	4,042	—	23.8	30.8	—	6.8	7.7	2.8
Research-Cott.	*386,155	(14.0)	(11,045)	—	2,701	(79.4)	10.0	6.6	(1.3)	6.8	7.9	1.9
Conrac	*141,136	21.4	10,685	0.2	6,985	(13.4)	7.9	6.0	75.5	6.3	8.9	3.9
Gulton	*151,180	(2.9)	6,242	—	3,942	—	7.2	—	31.2	6.1	8.8	2.4
Kysor Ind.	118,731	22.6	4,296	—	2,664	—	4.2	77.4	—	5.8	8.7	3.2
Burroughs	4,296,500	4.9	167,700	—	196,900	67.4	12.4	—	15.1	5.6	7.9	5.2
Compudyne	79,643	(7.2)	4,294	(23.4)	761	(31.2)	12.5	26.5	16.7	5.5	15.6	1.8
McGraw-Ed.	*2,093,700	(7.4)	73,800	(26.1)	33,400	(42.6)	33.8	33.4	(5.8)	5.3	10.7	3.1
GTE	*12,943,918	10.0	721,089	(13.3)	955,604	14.6	10.9	(1.9)	11.9	5.0	11.0	6.7
Mark Controls	268,902	(1.1)	471	(69.1)	4,094	61.8	6.3	(12.3)	13.1	4.5	8.0	1.9
Compucorp	*38,258	8.4	(1,061)	—	(4,566)	—	62.0	60.9	—	(4.7)	(90.8)	(1.9)
Modular Comp	*74,947	(19.2)	(3,175)	—	(23,804)	—	3.8	—	—	(6.5)	(6.3)	(3.5)
Apollo Comp.[b]	80,659	—	22,267	—	13,127	—	—	—	—	(9.0)	(9.0)	(23.3)
Automatix[c]	13,011	61.5	(451)	—	(2,056)	—	—	36.4	—	(16.9)	(20.6)	—

SOURCES: Company annual reports and 10-K's; and Moody's Manuals #Canadian dollars [a] All averages for less than five years [b] Founded in 1981 [c] Founded in 1980

FOOTNOTES: Revenues include all income except interest income

Operating Profits equal Revenues minus the sum of: Cost of Sales, Depreciation, and Selling, Administrative and General Expenses

Return on Invested Capital equals Net Earnings divided by the sum of Shareholders' Equity and Long-term Debt

Return on Equity equals Net Earnings divided by Shareholders' Equity

Return on Sales equals Net Earnings divided by Revenues

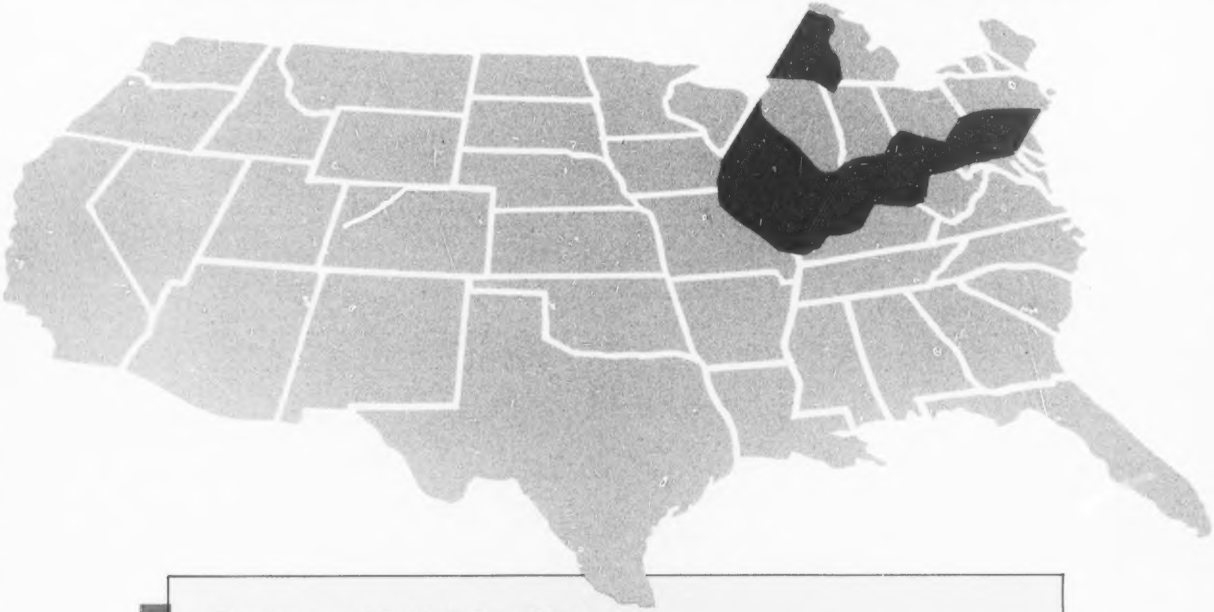
*Discrepancies in figures from one source to another —Percent over 99.9%

N/A Information not available CNC Could not calculate due to missing or conflicting info.

Reprints available while supply lasts. For single copy, circle No. 85 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1075.

A CLOSEUP LOOK AT

AMERICA'S INDUSTRIAL HEART AND SOUL



Employment In Metalworking
In Thousands Ave. Employment For Year In SIC's 33-37

	Industrial Heartland					
	Illinois	Indiana	Michigan	Ohio	Penna.	Totals
1979	697.0	474.5	853.5	839.4	677.8	3,542.2
1983	471.6	347.0	620.5	610.3	478.8	2,528.2
Total Decrease						**−28.6%**

A leading "think tank" has reached several startling conclusions about the region and has proposed some dramatic courses of action.

BY EDWIN BOWERS

America's industrial heartland—Wisconsin, Illinois, Michigan, Indiana, Ohio and Western Pennsylvania—is at a crossroads of crisis. Many believe as this "backbone of America" goes, so goes the nation. Declines in American production of autos, machine tools, construction equipment and steel have been well documented.

"In the end, our overall national standard of living depends on the output of the industrial heartland," said Sen. Donald Riegle (D., Mich), a legislator intimately involved with the fate of America's center. "We cannot allow this region to become a wasteland."

A major national "think tank"—SRI International, formerly the Stanford Research Institute, Menlo Park, Calif.—has taken a close look at the region, reaching several startling conclusions and proposing some dramatic courses of action.

Before zeroing in on America's heartland, several observations are necessary about the state of the nation and the economy generally. It has been observed that in much of the U.S., traditional management practices are not effectively adjusting to fast-changing markets, to new technologies and the current human resources environment.

Employment (Thousands of Workers)

	All Mfg.	Primary Metals	Fab. Metal Products	Machinery Except Electrical	Electric & Electronic Equipment	Transportation Equipment
Illinois						
1979	1,271.6	99.4	146.2	224.9	168.3	58.2
1980	1,208.2	89.8	135.4	225.5	160.8	53.1
1981	1,131.4	81.3	129.3	218.9	150.8	42.6
1982	1,019.5	69.9	111.7	178.9	136.7	38.1
1983	951.1	57.9	105.5	143.6	128.8	35.8
Indiana						
1979	733.2	112.1	63.7	81.7	114.2	102.8
1980	657.0	101.6	55.1	75.3	101.6	82.8
1981	652.6	102.2	53.3	73.9	103.3	81.1
1982	583.3	87.3	47.4	64.4	88.3	70.8
1983	576.6	82.7	48.7	59.1	84.2	72.3
Michigan						
1979	1,160.2	88.0	150.8	167.2	41.9	405.6
1980	998.9	67.3	118.0	158.4	34.9	340.2
1981	979.0	65.0	117.5	154.8	33.0	334.9
1982	874.1	48.8	102.0	131.8	29.7	303.2
1983	880.8	50.5	102.5	116.6	29.9	321.0
Ohio						
1979	1,382.3	158.9	173.5	223.6	117.6	165.8
1980	1,264.3	139.8	175.5	211.4	106.4	139.1
1981	1,232.6	138.3	157.6	204.2	101.9	136.9
1982	1,103.6	113.3	154.9	179.3	93.2	122.0
1983	1,066.9	104.5	130.9	153.1	90.2	131.6
Penna.						
1979	1,386.8	204.1	118.0	142.0	126.4	87.3
1980	1,328.2	190.2	112.8	144.2	122.5	81.5
1981	1,299.0	184.0	108.7	143.6	117.2	77.5
1982	1,167.1	142.0	96.6	127.5	107.8	63.1
1983	1,094.8	122.7	86.8	108.4	101.2	59.7

Also basic consumption patterns in the U.S. are shifting in several ways. First, more sophisticated, segmented markets are becoming the norm. Also there is a shift toward consumption of new types of consumer products currently not made in the Midwest—electronic items, for example.

The general pattern of market change gives increasing advantages to smaller, decentralized, more responsive companies. This is because new, more flexible technologies have made it easier to enter new markets. Also, new firms have no investments in outmoded technologies to write off. Small and decentralized companies are better able to take advantage of the existing atmosphere in America of rapidly changing markets. The latter advantage is abetted by the easy access by small firms to simple computer systems that inexpensively and easily create sophisticated product and consumer information networks. Small and decentralized companies appear better able to meet new consumer demands and apply new technologies in today's atmosphere of fast changing markets.

There is no way to stop the trend to accelerating technological and economic change, a trend which is causing industries to restructure and established firms to lose their historic competitive advantages. Declines in the use of steel and other basic materials, relative to the economy will also continue. This trend is an important consequence of the nation's economic maturity and will persist.

Thus it seems the traditional, slow-moving mass production markets to which the midwest was so well adapted are rapidly disappearing. Right now the U.S. economic environment has changed in ways that increasingly threaten to become injurious to the midwestern economy, unless steps are taken.

According to SRI, in many ways the region's current problems can be traced back to its past success. "Management, labor and government became too well adapted to the markets and competitive situation of the 1950s and 1960s. When the economy entered a period of accelerating change in the 1970s, mid-America found it difficult to adjust to the new era. The midwest has been characterized historically by leadership, imagination, cooperation and hard work on the part of all sectors of its economy."

Advantages

Originally mid-American industrial leadership was built on a number of inherent advantages. These included a large domestic market, low energy costs, large pools of investment capital, technological leadership and favorable locale. Gradually those edges have been worn down so that, coupled with the appearance of several new market trends, mid-American industrial leadership is being severely challenged.

Currently many mid-American firms have been so weakened financially they do not have sufficient assets to back their loan needs, according to SRI. Nevertheless, the study group says, lack of venture capital is not the main problem. It asserts mid-America needs more "venturesome investment capital in large amounts for long-term investment. Investors must be able to independently review proposed technologies and proposed markets. Such risky and sophisticated investments require equity capital rather than traditional loans."

In short, meeting midwestern capital needs will require new financial instruments, more flexibility among depositors and more flexible regulations. Each industry has its own individual problems; actions need to be tailored to the needs of each. Thus it is useful to look at each major industry individually.

During the 1970s the machine tools and industrial machinery industries were the most important growth industries in the midwest. But automotive industry mass production worked against computerized numerically controlled (CNC) machine tools. CNC flexibility was considered necessary. However, when automotive engineers began to see the penalties for mass production as the market became more subject to preference swings—where each swing missed meant a loss of market share—the situation changed.

The SRI cites "technology" as the key to the machine tools market "but what matters is the technology that fits the customer's needs. The U.S. developed the key technology of computer-controlled and computer-designed equipment, but the Japanese have applied these technologies more effectively—at least in machine tools."

According to SRI, the combination of fast-moving technology and growing foreign competition has put increasing pressure on many small firms in the machine tool industry. There are more than 1,100 firms and the top four have only 22 pct of the market. New product investments are "bet-the-company" gambles. "All these trends are forcing increasing numbers of mergers and causing more frequent bankruptcies," SRI says.

The market for machinery and machine tools is an excellent example of greater sophistication among consumers and of the difficulties of translating technical leadership into market leadership. Machine tools have become sophisticated and expensive items. Customers are very cautious about buying a $300,000 plus piece of equipment. They make extensive calculations of price-performance ratios and include service and training costs as part of the overall equation.

Foreign Competitors

The general economic recovery should boost all these industries in the next several years, SRI speculates. The market for machine tools and industrial machinery should be relatively strong in the remainder of the 80s, but foreign competition will continue to grow. One of the more difficult transitions facing the midwest is the transition from mass production of consumer goods to specialized production of capital goods.

The midwest can have more jobs in producing the machinery that goes into the production of steel, autos or televisions. But the price for those jobs will be more imports and fewer jobs in the production of those latter three products. The region probably will have more and better-paying jobs if it produces more steel machinery and less steel. But making the switch in the midwest economy to that type of industry will be a difficult one, the SRI says.

In its efforts to revitalize, the steel industry in the midwest must surmount many obstacles. For example, SRI says it sees an industry in a state of over-capacity and at a minimum level of modernization. Also, foreign steel subsidies and the international strength of the U.S. dollar are factors operating against the industry. The high costs of capital and labor must be overcome in order to revive the industry. The SRI criticizes the industry for a "low rate of new technology adoption." but points out if and when that happens there will be a critical need for a skilled labor force to deal with it.

The steel industry, the study observes, has a history of sacrificing long-term goals and benefits for short-term goals and benefits. An after-effect of that has been a tradition of risk aversion and lack of entrepreneurial drive by current management.

Although optimistic for the long-term, the panel initially takes a harsh view asserting: "The U.S. (steel industry) has rarely been the first to apply new products and processes." It says: "Currently there are numerous existing advanced technologies that, if applied, will have significant impact on the efficiency of steel productions. Wider adoption of these technologies will improve the future international performance of the industry. More efforts of the industry should be placed on technology transfer."

SRI says R&D expenditures by steel firms, as a percentage of sales, have declined over the years. The competitiveness of the midwestern steel industry will be determined largely by how quickly and effectively it can choose and apply new steel production and process control technologies.

Significant Change

The consensus is that a strong steel recovery will require significant changes. There must be less of an adversarial relationship between management and labor and management and government. Retirement of inefficient production facilities is needed along with increased emphasis on producing goods with high added value. Along with that must come increased rate of technology development and acceptance of technologies such as continuous casting and fully computerized rolling mills.

Another apparently unavoidable change will be contractions and consolidations similar to the merger between Republic Steel and LTV Corp. There must be a shift toward more entrepreneural management practices, paying more attention to market needs and international competition similar to the mini-mill approach where plants are built to fit very specific local markets. Mini-mills are predicted to reach 30 pct to 35 pct of the steel market by 1990.

As recovery continues and steel firms become more profitable, capital investment needs will increase. The industry must try novel financing techniques—such as limited partnerships and equipment leasing—in order to fund building new, more efficient facilities and R&D activities. This will, in turn, create a need for capital equipment.

There can be no midwestern recovery without a healthy auto industry, SRI observes. Right now autos are faced with some confusing market trends. For example, foreign competition will continue to intensify. Nevertheless, the industry has become a leader in many areas such as the development of new high-strength steels, new plastics and other new materials. And, the industry has become "high-tech". It is the nation's largest user of robots and computer assisted design systems.

SRI asserts the auto industry is better prepared to meet the challenges of the 1980s than those of the last decade, but times will still be difficult.

The current growth in domestic auto sales was initiated and can be maintained only by continuing emphasis on new technology and introduction of new products better suited to current market demands.

R&D Effort

The U.S. heavy equipment industry has an impressive innovation record. Even with the recent recession the industry kept up a significant effort in innovation. And, SRI says, there continues to be an increasing need for more development and faster implementation and acceptance of electronic sensors and microprocessors. With those better performances, high productivity, higher reliability, better diagnostics and other similar benefits are possible.

In the 1980s the market environment in the midwest will change even faster than it did in the 70s, SRI observes. The markets of the future will require more attention to quality, use of advanced production technologies to improve productivity including more frequent product changes, and use of advanced market information systems. Industries must realize and accept that many traditional market structures have changed, radically and permanently, and that new management attitudes and practices are the key to corporate survival and prosperity.

Fluctuations in interest rates and foreign trade make the midwest more sensitive to economic cycles in the 80s than was the case in the 60s or 70s.

The final analysis is mid-America must, to a larger degree, be the master of its own destiny. SRI points out the major issues on which the midwest must strive to exercise more influence are twofold. First: foreign trade. In that area the principal problem has been the loss of foreign trade. In that area the principal problem has been the loss of competitive position to domestic and foreign producers. Exports are probably one of the great hopes of the midwest economy, but the region might have to surrender low-value-added markets to foreign suppliers.

Nevertheless, the principal issue for the midwest is not foreign competition, but continuing to get into foreign markets. Foreign markets still have enormous growth potential and the long-run market potential is greatest in developing nations. Those countries' growth markets continue to be machinery and industrial equipment, areas where the midwest has and continues to excel.

The trade balance is likely to deteriorate further over the short-term—within the next year—but there are many reasons for long-range optimism, depending largely on Federal economic policies and U.S. managers to compete for these markets.

Secondly, Federal economic policies, that is, monetary and fiscal, will continue to have a major impact on interest rates and the trade value of the dollar. "It is critical," says Sen. Alan J. Dixon (D., Ill.), "that we coordinate our tax, spending and monetary policies."

SRI sets a five-point program for the future. "There is a need for more long-term economic development strategies," the study group says. SRIs plan consists of: (1) more effective utilization of new technologies; (2) more responsive entrepreneurial and technically sophisticated management practices; (3) more strategic application of financial resources; (4) more cooperative labor-management relations; and (5) more investments in human capital.

A step required for future success, asserts SRI, is realizing the entry of new technology and employment of labor skills will require a style of management. This extra effort by management coupled with joint efforts of labor unions, financial institutions and local and Federal governments will help industry take better advantage of future growth in demand. □

Reprints available while supply lasts. For single copy, circle No. 91 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1081.

2nd QUARTER EARNINGS

STEEL STALLED; NONFERROUS GAINS SLIGHTLY

BY GEORGE MCMANUS & ROBERT REGAN

Steel

A cruel fate gave steel companies a small taste of prosperity in the second quarter then shoved the companies back down again.

Prosperity was in the form of profits for most of the mills. The downward shove was supplied by a 10 to 15 pct drop in shipments in the third quarter. The decline will mean profits that are skimpy or nonexistent.

Earnings weren't exactly robust in the second quarter. The combined profit of the five largest mills came to 1.6 pct of sales. Armco, Inc. and LTV Corp. continued to lose money in the quarter.

However, 15 steel producers moved from red ink in the second quarter of 1983 to black ink in the second quarter of 1984.

There were some decisive upward swings. United States Steel Corp. went from a net loss of $112 million in 1983 to a profit of $140 million in 1984...The steel portion of U.S. Steel had an operating profit of $84 million in 1984. That compared with an operating loss of $130 million in the second quarter of 1983.

U.S. Steel faces a depressed order book in the third quarter, said David M. Roderick, chairman. The outlook is "less rosy," said Mr. Roderick, "although we expect to be narrowly profitable in the third quarter."

For Bethlehem Steel Corp., a second quarter net profit of $24 million was the first since 1981. The market slide was noted by Donald H. Trautlein, chairman of Bethlehem.

"As a result, we expect to be at about a break-even level for the third quarter," said Mr. Trautlein.

After a rebound in the first quarter steel companies were slapped back down again. In the nonferrous sector, aluminum continued to show the way with copper and nickel still waiting for a pickup in the capital goods.

National Intergroup, Inc., made one of the stronger showings in the second quarter. National's net income of $24.6 million came to 3.1 pct of sales. The net was reduced by a non-recurring charge of $16.9 million. Without this, the sales margin would have been 5.2 pct.

Inland Steel Co. continued its profit recovery in the second quarter. The $24.6 million earned by Inland was up from a loss of $29.7 million in the second quarter of 1983.

"Looking ahead, we view the third quarter with caution," said Frank W. Luerssen, chairman and president of Inland. Mr. Luerssen looked for an early recovery "although prices will continue to be depressed.

Somewhat surprising was Armco's second quarter net loss of $14.1 million. High interest charges and continued losses in the oil country business contributed to the deficit. Armco's carbon steel segment had an operating profit of $44 million for the first six months of 1984.

Armco doesn't expect its oil country business to earn money in the second half. The energy field is one of many where capital spending is still lagging.

LTV had a net loss of $22.7 million in the second quarter. Like Armco, LTV was hit by higher interest charges and by the depressed state of the oil country market.

Not included in LTV's results were the financial returns of what had been Republic Steel. Republic is now part of LTV Steel but second quarter results won't be available for another month.

The profit of employee-owned Weirton Steel Corp. jumped from $9.6 million in the first quarter of 1984 to $22.7 million in the second quarter. Weirton's 7.4 pct return on sales was the highest for any of the big mills.

It appears that Weirton is making good on a game plan that calls for expanded sales of cold rolled sheet. The company shipped 611,000 tons in the second quarter. That was up 6.6 pct from the first quarter.

"We were able to achieve our second quarter sales and shipment objectives in both tin mill products and sheet steel," said Robert L. Loughhead, president of Weirton.

In the specialty steel field, Carpenter Technology Corp. earned a whopping 7.0 pct on second quarter sales. After one brief period of red ink, Carpenter has returned to its customary profitable condition.

"...we expect continued improvement in our shipping levels, selling prices, and mix of products...," said Paul R. Roedel, president of Carpenter.

Temporary Situation

Most steel producers feel they are looking at a temporary market lag. "The softening of demand that has impacted domestic steel producers in recent weeks is apparently related to customer inventory reductions and high import penetration rather than to an economic slowdown," said Mr. Luerssen of Inland.

There is no question the inventory cutting of service centers is a major cause of the slowdown. It isn't entirely clear that the economy is continuing to expand. In June, the government's index of leading indicators turned down for the first time in 21 months.

Most economists regard the June flip as just that—a minor aberration and not the signal for a recession. Steel producers don't see a prolonged slide but neither do they look for a real boom.

Mr. Roderick predicted that sheet shipments would rise from 76 million tons in 1984 to 82 or 83 million tons in 1985. He didn't look for a dramatic rise in capital markets.

Steel imports continue to worry and vex domestic producers. Nearly 1.8 million tons of foreign steel entered the U.S. in June. A record 12.4 million tons were imported in the first half of this year.

"The gravity of the steel trade crisis should now be clear to even the most casual observer," said Mr. Trautlein. He called for revision of the import curbs recommended by the International Trade Commission (ITC).

"About one-third of the steel products made in the U.S. are not covered by the recommendations," he said.

Mr. Roderick was even more emphatic in his criticism of ITC proposals. "What appears to be a remedy is not a remedy at all," he said. Had the ITC plan been in effect last year, he said, the effect would have been to increase rather than reduce imports.

"What we need is a legislated quota," said Mr. Roderick. Quota legislation is now supported by 219 members of the House of Representatives, he said. "In the Senate, we're up to 27."

Nonferrous

Nonferrous companies continued to trudge their way toward recovery in the second quarter of 1984. The aluminum industry once again had a better time of it than did producers of copper and nickel.

Low copper prices adversely impacted results of Asarco and Phelps Dodge Corp., both of which reported losses in the period, and helped pull Newmont Mining's profits lower by 20 pct.

Asarco would have reported a net profit for the second quarter except an estimated $60 million cost for closing its Tacoma, Wash. copper smelter, but the company also noted that the average copper price was down to 70.5¢ a lb. from the average of 81¢ a lb for the second quarter last year. The price of silver, another important metal for Asarco, was down sharply, but average prices for lead and zinc moved up.

Phelps Dodge said current "unrealistically low" copper prices are well below its per lb production costs and those "of all but a handful of copper mines throughout the world."

Both Asarco and Phelps Dodge sold more copper in the quarter just ended than they did in the second quarter of 1983. Phelps Dodge also noted that copper consumption was strong during the first half of 1984 and estimated that the worldwide copper surplus was reduced by half in the six-month period. The company said the copper price (adjusted for inflation) nonetheless fell to the lowest level in this century amid concerns for rising interest rates, a strong dollar and weak precious metals prices—and "continuing concern over production policies of foreign, state-owned mines."

Asarco said copper's supply/demand fundamentals have been improving since the start of the year and physical stocks have fallen substantially, suggesting that copper prices on the commodity exchanges should eventually respond.

One of the missing ingredients for copper continues to be the capital goods sector. The business recovery to date appears to be mainly a consumer-led recovery with no one following. Passenger car and truck production and sales have been strong since the start of the year, chewing up a lot of metal in the process. But Detroit's gains, fueled by higher car prices and higher unit sales, haven't trickled down to the raw materials suppliers yet.

A sleeping capital goods sector also is limiting the recovery capability of the nickel industry. Inco Ltd.'s operating results for primary metals and alloy products were in the black in the second quarter and first half, its shipments of nickel and copper were higher in the second quarter and first half and average nickel prices were higher as well. The benefits, however, extended only to cutting the second quarter loss to $15.1 million from the $37.1 million lost in the same 1983 period. And the company's nickel stocks rose to 94 million lbs from the 83 million lbs on hand at the start of the year. Inco said the inventory will be reduced as the result of four-week vacation shutdowns which started early in July at the Ontario and Manitoba divisions.

Price recovery was the main contributor to sales and profit gains by North America's four largest aluminum producers. Aggregate shipments by Aluminum Co. of America, Alcan Aluminum Ltd., Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp. were down 4.6 pct to 1.42 million short tons, but aggregate gross revenues were up 17.6 pct to $4.96 billion. All four operated in the black in the period just ended (Reynolds and Kaiser were in the red in the second quarter last year) and aggregate profits equaled $280.6 million compared with a negative $82.8 million in the second quarter last year.

Alcoa said its earnings gain reflected higher prices on many mill products, improved operating efficiencies and higher productivity. The company noted that the U.S. spot price for primary aluminum ended the second quarter 13.3 pct lower at 62¢ a lb and said this reflected a modest rise in inventories worldwide and the continued strength of the U.S. dollar. Alcoa also said prices softened on some common alloy products tied to the ingot price.

Kaiser Aluminum said its aluminum division operated near the breakeven point in the quarter just ended, compared with a $100 million loss in the same 1983 period.

Reynolds Metals said it expects the aluminum business to strengthen in the latter half of 1984 despite a slowing in the new order rate and softening of prices for certain aluminum products. The company said the industry as a whole should show an 11 pct gain in shipments in 1984.

(Cont. on p. 54A8)

STEEL SHOWS SOME UPWARD MOVEMENT

SECOND QUARTER PROFIT REPORT—1984 (In Millions of Dollars)

	EARNINGS				SALES		
	1984 E/S	2nd Quarter 1984	2nd Quarter 1983	Pct Change	2nd Quarter 1984	2nd Quarter 1983	Pct Change
USS	2.9	$140.00	$(112.00)	—	$4,900.00	$4,400.00	+11%
BETHLEHEM	1.6	24.00	(70.70)	—	1,505.10	1,234.60	+22%
ARMCO	—	(14.10)	(75.80)	—	1,196.00	1,079.00	+11%
NATIONAL	3.1	24.64	(99.17)	—	794.86	752.14	+5.7%
INLAND	2.6	24.65	(29.74)	—	938.95	748.12	+26%
LTV*	—	(22.70)	(61.30)	—	1,580.30	993.70	+59%
TOTAL	1.6	176.49	(448.71)	—	10,915.21	9,207.56	+19%
WHEEL-PGH	1.9	5.30	(18.89)	—	279.08	191.57	+46%
INTERLAKE	4.1	10.24	3.58	+186%	248.56	206.01	+21%
CYCLOPS	1.7	5.51	(0.45)	—	317.11	243.20	+30%
CF&I	2.5	2.21	(14.67)	—	89.86	56.93	+58%
COPPERWELD	6.9	8.54	(12.37)	—	124.42	79.98	+56%
CARPENTER	7.9	12.80	9.70	+32%	162.86	112.39	+45%
LUKENS	2.7	3.11	(3.33)	—	113.96	87.27	+31%
PHOENIX	—	(0.74)	(6.96)	—	32.64	30.20	+8.1%
FLORIDA	1.3	0.94	0.76	—	72.09	61.52	+17%
LACLEDE	3.8	2.23	1.41	+58%	59.29	45.56	+30%
NUCOR	5.4	9.2	4.8	+8.9%	169.0	127.6	+32%
EASTMET	1.8	1.26	(2.56)	—	69.03	42.60	+62%
WEIRTON	7.4	22.75	—	—	306.28	—	—
QUANEX	3.3	3.51	(0.25)	—	106.45	74.63	+43%

*Does not include Republic Steel

ALUMINUM STILL CLIMBING; NICKEL AND COPPER STILL WAITING

SECOND QUARTER PROFIT REPORT (Millions of Dollars)

( ) = Denotes Loss

	Earnings			Sales and Other Revenues		
	2nd Q 1984	2nd Q 1983	Pct Chg.	2nd Q 1984	2nd Q 1983	Pct Chg.
ALCAN	$98.0	$3.0	+3,166.7	$1,478.0	$1,329.0	+11.2
ALCOA	112.8	34.6	+226.0	1,452.3	1,257.9	+15.5
AMAX	9.8	(21.2)	—	651.4	567.8	+14.7
ASARCO	(28.6)	27.6	—	357.2	380.3	−6.1
BRUSH WELLMAN	10.7	6.3	+69.8	84.6	60.5	+39.8
CABOT CORP.	26.5	14.1	+87.9	468.3	389.0	+20.4
COMINCO	24.8	(3.7)	—	439.2	413.5	+6.2
ENGLEHARD	18.4	18.0	+2.2	606.0	617.0	−1.8
FREEPORT MCMORAN	25.9	20.9	+23.9	217.8	186.2	+17.0
INCO LTD.	(15.1)	(37.1)	+59.3	385.0	284.0	+35.6
KAISER ALUMINUM	32.5	(51.3)	—	1,017.2	781.9	+28.9
MARTIN MARIETTA	74.1	57.0	+30.0	1,176.0	953.5	+23.3
NEWMONT MINING	12.6	15.8	−20.3	203.4	186.9	+8.8
NORANDA MINES	19.4	9.2	+110.9	986.6	795.1	+24.1
OLIN CORP.	33.0	24.0	+37.5	545.3	490.3	+11.2
OREGON MET	1.0	(0.3)	—	10.4	8.9	+16.9
PHELPS DODGE	(20.7)	0.3	—	255.8	282.1	−9.3
REYNOLDS METALS	37.3	(69.1)	—	1,003.1	853.4	+17.5
VULCAN MATERIALS	25.6	15.4	+66.2	259.2	199.9	+29.7

Alcan Aluminum Ltd.: Net for the '84 period includes an $11 million tax-loss carryforward. **Amax Inc.:** Net for the '84 quarter includes tax credits of $5.6 million and a $20.7 million gain on sale of shares in oil and gas interests. **Asarco Inc.:** Net loss for the '84 period includes a pretax charge of $38 million reflecting estimated $60 million cost of closing the Tacoma, Wash. copper smelter and $22 million credit from changes to estimated costs for previous plant closings. **Cominco Ltd.:** Canadian funds. Net for the '84 period includes $5.2 million extraordinary credit gained mainly on sale of U.S. oil investment. **Martin Marietta Corp.:** Net for the '83 period includes pre-tax gain of $67 million from sale of assets. **Phelps Dodge Corp.:** Net loss for the '84 period includes extraordinary gain of $2.4 million. **Reynolds Metals Co.:** Net for the '84 period includes a $3.2 million net charge for closing Jamaican bauxite mining operations.

Reprints available while supply lasts. For single copy, circle No. 90 on inquiry card. Additional copies, $1.00 each, for articles up to 8 pages. Longer ones $2.00 each. Please include payment with orders of $10 or less. Quantity reprints available. For information, write: IRON AGE, Reader Service, Chilton Way, Radnor, Pa. 19089. Ask for reprint No. 1080.

PRICE & PRODUCTION DATA

(Effective August 13, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	183	185	215	159
Pittsburgh	222	233	213	204
Youngstown	82	86	82	90
Lake Erie	124	125	122	128
Detroit	161	147	156	141
Chicago	427	437	463	453
Cincinnati	83	87	100	8
St. Louis	71	82	59	74
Southern	175	183	188	139
Western	67	71	78	88
U.S. Production	1,595	1,636	1,676	1,590

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective August 13, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,595	1,636	61,365	49,467
Capability Utilization Rate	61.8	63.4	74.1	53.5

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.582	26.217
Pig iron* * (Net ton= 2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 82.18	$ 81.83	$ 82.17	$ 75.17
No. 2 bundles	$ 50.83	$ 50.83	$ 50.83	$ 45.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh..	$ 87.50	$ 86.50	$ 88.50	$ 79.50
No. 1 steel, Philadelphia ..	80.50	80.50	80.50	68.50
No. 1 steel, Chicago	78.50	78.50	77.50	77.50
No. 1 bundles, Detroit	70.50	70.50	75.50	71.50
Low Phos., Youngstown ..	80.50	80.50	80.50	79.50
No. 1 mach'y cast., Pgh	71.50	71.50	75.50	74.50
No. 1 mach'y cast., Phila .	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi..	115.50	115.50	115.50	108.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective August 13, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	52.84	52.27	8/13/84
Copper (C)	63.00-64.00	62.00-64.00	8/10/84
Lead	28.00-32.00	28.00-34.00	8/6/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	217.54	214.83	8/13/84
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	48.00	48.00-50.00	8/13/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$343.50
Indium, dollars per troy oz.	$3.30
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$293-$305
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$136
Platinum, per troy oz.	$337
Rhodium, per troy oz.	$700
Silver ingots, per troy oz.	$7.62
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Aug. 6—567.37
Aug. 7—565.92
Aug. 8—565.92
Aug. 9—566.05
Aug. 10—566.31

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	58½	57½
Yellow brass	55	54½
Red brass	55¾	55¼
Comm. bronze	56⅜	55½
Mang. bronze	58	50
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	47
Light copper	38

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	52
No. 2 copper wire	43
Light copper	34
No. 1 composition	54
No. 1 comp. turnings	52
Hvy. yellow brass solids	36
Hvy. yellow brass turnings	34
Radiators	41

Aluminum

New mixed clips	37	—38
Old sheet	35	—36
Old cast	35	—36
Clean dry borings	36	—37

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	35	—36
Mixed L.C. clips	33	—34
Old sheets and cast	28	—29
Borings and turnings	21	—22
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	46	—47
No. 2 copper wire	38	—39
Light copper	34	—35
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	39	—40
Cocks and faucets	30	—31
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	43	—44

Lead

Heavy soft lead	10	—11
Whole batteries	3	— 4
Type metal	16	—17
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE AUG. 13, 1984

(Effective August 13, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 87.00 to	$ 88.00
No. 2 hvy. melting	77.00 to	78.00
No. 1 dealer bundles	98.00 to	99.00
No. 1 factory bundles (auto)	90.00 to	91.00
No. 2 bundles	53.00 to	54.00
No. 1 busheling	104.00 to	105.00
Machine shop turn.	12.00 to	13.00
Shoveling turnings	49.00 to	50.00
Cast iron borings	48.00 to	49.00
Low phos. punchings plate	104.00 to	105.00
Heavy turnings	76.00 to	77.00
No. 1 RR hvy. melting	92.50 to	93.50
Rails 2 ft. and under	113.00 to	114.00
Scrap rails, random lgth.	99.00 to	100.00
RR specialties	105.00 to	106.00
No. 1 machinery cast	71.00 to	72.00
Cupola cast	64.00 to	65.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	550.00 to	560.00
18-8 turnings	450.00 to	460.00

Chicago

No. 1 hvy. melting	$ 78.00 to	$ 79.00
No. 2 hvy. melting	71.00 to	72.00
No. 1 dealer bundles	93.00 to	94.00
No. 1 factory bundles (auto)	87.00 to	88.00
No. 2 dealer bundles	49.00 to	50.00
No. 1 busheling	92.00 to	93.00
Shredder scrap	90.00 to	91.00
Machine shop turn.	42.00 to	43.00
Mixed bor. and turn.	43.00 to	44.00
Shoveling turnings	47.00 to	48.00
Cast iron borings	47.00 to	48.00
Low phos. forge crop	111.00 to	112.00
Low phos. punchings plate ¼ in. and heavier	121.00 to	122.00
Low phos. 2 ft. and under	116.00 to	117.00
No. 1 RR hvy. melting	83.00 to	84.00
Scrap rails, random lgth.	89.00 to	90.00
Reroller rails	108.00 to	109.00
Rails, 2 ft. and under	113.00 to	114.00
RR couplers and knuckles	97.00 to	98.00
RR car axles	129.00 to	130.00
No. 1 machinery cast	115.00 to	116.00
Cupola cast	102.00 to	103.00
Stove plate	99.00 to	100.00
Steel car wheels	103.00 to	104.00
Stainless		
18-8 bundles and solids	490.00 to	500.00
18-8 turnings	420.00 to	430.00
430 bundles and solids	120.00 to	125.00
430 turnings	80.00 to	90.00

Philadelphia

No. 1 hvy. melting	$ 79.00 to	$ 82.00
No. 2 hvy. melting	69.00 to	72.00
No. 1 dealer bundles	93.00 to	96.00
No. 2 dealer bundles	48.00 to	51.00
No. 1 busheling	92.00 to	95.00
Shredder scrap	98.00 to	101.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	41.00 to	44.00
Low phos. 5 ft. and under	95.00 to	98.00
Low phos. 2 ft. punchings	115.00 to	118.00
Electric furnace bundles	101.00 to	104.00
RR specialties	100.00 to	103.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	70.00 to	73.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 51.00 to	$ 52.00
No. 2 hvy. melting	50.00 to	51.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	35.00 to	36.00
No. 1 busheling	69.00 to	70.00
Drop forge flashings	43.00 to	44.00
Machine shop turn.	45.00 to	46.00
Mixed borings and turn.	23.00 to	24.00
Shoveling turnings	46.00 to	47.00
Cast iron borings	36.00 to	37.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	445.00 to	455.00
18-8 turnings	350.00 to	360.00
430 bundles and solids	100.00 to	110.00

Youngstown

No. 1 hvy. melting	$ 66.00 to	$ 69.00
No. 2 hvy. melting	47.00 to	50.00
No. 1 dealer bundles	79.00 to	82.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turn.	13.00 to	16.00
Shoveling turnings	18.00 to	21.00
Low phos. plate	79.00 to	82.00
Electric furnace bundles	76.00 to	79.00
Galvanized bundles	67.00 to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00 to	$ 63.00
No. 2 hvy. melting	37.00 to	40.00
No. 1 dealer bundles	68.00 to	71.00
No. 1 factory bundles	72.00 to	75.00
No. 2 bundles	19.00 to	22.00
No. 1 busheling	73.00 to	76.00
Machine shop turn.	8.00 to	11.00
Mixed bor. and turn.	8.00 to	11.00
Shoveling turnings	10.00 to	13.00
Cast iron borings	13.00 to	16.00
Cut structural & plates, 2 ft. and under	105.00 to	108.00
Low phos. punchings plate	105.00 to	108.00
Drop forge flashings	42.00 to	45.00
Foundry steel, 2 ft. & under	62.00 to	65.00
No. 1 RR hvy melting	79.00 to	82.00
Rails, 2 ft. and under	105.00 to	108.00
Rails, 18 in. and under	108.00 to	111.00
Steel axle turnings	59.00 to	62.00
Railroad cast	92.00 to	95.00
No. 1 machinery cast	102.00 to	105.00
Cupola cast	58.00 to	61.00
Stove plate	44.00 to	47.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	56.00 to	57.00
No. 1 busheling	79.00 to	80.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 bundles	37.00 to	38.00
Machine shop turn.	14.00 to	15.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	22.00 to	23.00
Low phos. plate	95.00 to	96.00
Structural and plate, 2 ft. and under	96.00 to	97.00
Rails, 2 ft. and under	94.00 to	95.00
Scrap rails, random lgth.	74.00 to	75.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 66.00 to	$ 67.00
No. 2 hvy. melting	55.00 to	56.00
Foundry steel, 2 ft.	66.00 to	67.00
No. 1 dealer bundles	66.00 to	67.00
No. 2 bundles	54.00 to	55.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	23.00 to	24.00
Cast iron borings	27.00 to	28.00
No. 1 RR hvy. melting	68.00 to	69.00
Rails, random length	70.00 to	71.00
Rails, 18 in. and under	89.00 to	90.00
RR specialties	85.00 to	86.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	50.00 to	51.00
Stove plate	83.00 to	84.00
Steel car wheels	97.00 to	98.00
Rerolling rails	80.00 to	81.00
Unstripped motor blocks	56.00 to	57.00

Birmingham

No. 1 heavy melting	$ 73.00 to	$ 74.00
No. 2 heavy melting	65.00 to	67.00
No. 1 dealer bundles	73.00 to	74.00
No. 2 bundles	52.00 to	53.00
No. 1 busheling	73.00 to	74.00
Shredder scrap	93.00 to	94.00
Machine shop. turn.	26.00 to	27.00
Shoveling turnings	40.00 to	41.00
Cast iron borings	40.00 to	41.00
Electric furnace bundles	64.00 to	65.00
Elec. furnace, 3 ft. & under	71.00 to	72.00
Structural and plate, 2 ft.	97.00 to	98.00
Structural and plate, 4 ft.	87.00 to	88.00
No. 1 RR hvy. melting	87.00 to	88.00
Scrap rails, random lgth.	82.00 to	83.00
Rails, 2 ft. and under	102.00 to	103.00
Angles and splice bars	87.00 to	88.00
No. 1 cupola cast	84.00 to	85.00
Unstripped motor blocks	67.00 to	68.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00 to	$ 60.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	71.00 to	72.00
No. 2 bundles	33.00 to	34.00
Machine shop turn.	5.00 to	6.00
Shoveling turnings	7.00 to	8.00
Cast iron borings	20.00 to	21.00
Low phos. 18 in. and under	88.00 to	89.00
Rails, random length	71.00 to	72.00
Rails, 2 ft. and under	87.00 to	88.00
No. 1 cupola cast	60.00 to	61.00
Heavy breakable cast	27.00 to	28.00
Drop broken cast	81.00 to	82.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	75.00 to	77.00
Machine shop turn.	14.00 to	16.00
Shoveling turnings	22.00 to	24.00
No. 1 machinery cast	85.00 to	90.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	14.00 to	15.00

San Francisco

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	17.00 to	18.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	81.00 to	83.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to	$ 48.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	36.00 to	38.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn.	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 70.00 to	$ 72.00
No. 2 hvy. melting	59.00 to	61.00
No. 2 bundles	41.00 to	43.00
No. 1 cupola cast	94.00 to	95.00
Mixed yard cast	84.00 to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	84.00
No. 1 dealer bundles	92.00
No. 2 bundles	48.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	92.00
Bush. new fact. unprp'd.	82.00
Machine shop turn.	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to	$ 74.00
No. 2 hvy. melting	59.00 to	60.00
No. 2 bundles	42.00 to	43.00
Machine shop turn.	16.00 to	17.00
Crushed turnings	34.00 to	35.00
Shredder scrap	78.00 to	79.00
Cut structural plate, 2 ft. and under	100.00 to	102.00
Cut structural plate, 5 ft. and under	87.00 to	89.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	75.00 to	76.00

PRODUCER KEY
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., Gulfport, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 3620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	27.00	33.90	33.70	31.00	25.06	22.67	19.55	31.80	34.34	50.60	69.58	73.19
Baltimore	26.90	30.72	37.59	39.82	34.75	28.80	22.60	38.65	57.45	64.70	71.71	75.11
Birmingham	25.28	32.43	32.34	30.92	24.87	23.01	19.99	30.45	49.31	58.90	68.10	74.43
Boston	34.94	40.19	45.64	47.54	35.34	30.06	23.59	39.92	47.92	52.53	61.17	66.10
Buffalo	31.10	35.68	41.89	40.15	32.59	27.12	19.86	36.11	42.73	47.85	54.88	61.76
Chicago	29.10	34.49	37.97	33.01	25.87	22.32	17.70	33.04	37.62	42.94	48.10	53.18
Cincinnati	28.32	34.18	36.74	32.41	24.04	23.97	17.90	32.96	37.16	42.22	46.73	52.44
Cleveland	28.48	34.22	37.48	36.74	26.92	26.13	18.81	36.34	39.72	44.35	48.47	55.33
Denver	33.62	38.88	40.88	36.36	34.45	28.66	21.62	44.31	52.10	60.06	67.39	75.21
Detroit	28.82	37.33	37.86	33.26	26.63	26.17	16.45	33.05	37.18	42.22	46.81	54.09
Houston	33.49	33.47	38.79	43.62	30.10	28.46	24.22	42.05	47.76	55.05	61.50	68.69
Kansas City	31.68	36.89	40.00	36.07	28.03	30.31	20.13	35.00	42.70	47.64	53.21	60.30
Los Angeles	28.68	34.90	38.63	42.22	34.75	36.18	27.29	43.06	54.80	60.63	65.43	72.14
Memphis	25.34	33.05	34.52	33.57	27.06	28.48	22.33	34.94	36.78	49.96	59.80	69.44
Milwaukee	29.35	34.89	37.85	33.48	25.03	23.90	17.58	32.83	37.54	42.78	46.73	53.60
New York	32.47	38.99	42.55	43.38	33.96	27.21	21.06	40.81	44.67	49.61	61.12	67.29
Philadelphia	30.41	38.99	41.23	43.50	31.05	28.11	20.85	38.37	45.27	51.38	61.22	67.64
Pittsburgh	35.27	40.97	45.23	43.45	37.60	30.44	21.29	29.80	41.40	47.58	53.03	60.02
Portland	28.96	32.08	38.73	36.93	32.88	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	29.08	34.33	39.15	42.73	35.98	35.38	26.70	44.22	52.75	60.38	67.30	73.42
Seattle	24.08	32.19	36.23	34.23	24.23	27.32	26.63	40.03	53.07	63.70	71.05	75.81
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	37.31	34.59	26.19	22.90	18.40	33.87	38.12	43.51	48.85	53.69
St. Paul	28.87	33.61	36.69	38.36	26.91	23.73	17.70	33.96	37.52	42.72	47.09	53.31

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2 15/16; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 72. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(2), C10, U1	$473.00
R3	$453.00
Midwest	
R3, W5	$453.00
S1, U1, I3	$473.00
C10	$473.00
K2	$453.00
West	
B3(2)	$463.00
C6	$453.00
Alloy, East	
R3,	$492.00
B3, U1, C10	$512.00
Midwest	
W5	$492.00
U1, C10, I3	$512.00
R3	$492.00
S1	$512.00
West	
B3	$502.00
C6	$469.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3	22.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
B3	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
C6	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
D1	22.05
I4	22.85
J3, D1, W3	22.05
G2, G3	23.45
N4	22.55
W5, S1, A7	23.75
U1, B3, I3	23.75
M2, R3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, R3, W3, J3, I3	22.05
G2, G3	23.45
S1	23.75
A7	25.35
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	26.10
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	44.80

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
M2, R3, W3	22.05
D1, J3	22.05
G2, G3	23.45
I4	22.45
U1, W5, S1, B3, I3, A7	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
R3, M2, W3	26.15
G2, G3, M11	27.85
I4	22.00
J3	26.15
D1	26.15
U1, W5, S1, B3, I3, A7	28.15
West	
U1	23.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1, W3	28.00
R3, Y1	28.00
G2, M11	30.00
U1, W5, S1, I3, A7	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1, I3, A7	29.65
J3	27.65
Long-Terne, Midwest	
W5, A7	31.65
U1	31.65
R3	29.35

Wire Rod

East	
B3(2)	22.35
Midwest	
N4, K2	22.35
U1	24.10
A7	22.00
West	
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	**per base box**
J3	$26.29
U1	27.74
B3	27.54
Midwest	
U1	$27.74
J3	26.29
M11	27.24
W3	26.29
W5	27.74
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.87
J3	21.49
U1	22.37
W3	21.49
W5	22.37
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$24.31
Midwest	
J3, W5	$24.01
I3, W5	24.57
W3	24.01
U1, M11	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$20.49
Midwest	
M11	$19.70
W5	19.70
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢

**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
J3	25.80
U1, C10, B3(3)	27.05
Midwest	
I4	23.95
U1, I3	27.05
R3, T10, C20, N4	25.80
K2	25.80
I3	22.00*
A7	20.25
West	
B3	25.80
C6	24.45
South	
A8	20.65
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
C10	31.00
Midwest	
W10, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
W14	22.20
B5	34.75
West	
R3	37.15
South	
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
R5, K3	27.95
R3, J3	27.95
U1, B3(2), C10	29.20
Midwest	
R3	27.95
I3, C10, U1	29.20
I4	26.10
I3	23.50*
A7	20.25
West	
B3	27.95
C6	26.60
South	
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1	37.90
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
Midwest	
R3	37.35
J3, W10, C10	34.85
B1	37.30
N9	34.85
L2	34.65
B5	38.60
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3	23.25
L4, U1	25.75
P2	25.75
J3	26.75
Midwest	
B3	23.25
I3	25.75
J3, A7	22.80
U1, I4, S1	25.75
R3	26.75
West	
C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
U1	25.75
Alloy, East	
B3	31.05
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	31.05
G2, G3	33.55
I4, U1	33.55
West	
B3	33.55
O2	31.00
South	
U1	33.55

Wire

Carbon Steel Wire, East	
B3	27.10
A11	22.15
Midwest	
R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
C6	24.95

PRICES POST MODERATE GAIN

Inflation may be back, but it is a much tamer creature. Producer prices, following three months of stability, finally crept up in July, but only by 0.3 pct, the U.S. Labor Department's Bureau of Labor Statistics said.

If this rate continued for the rest of the year, the result after compounding would be only a modest 3.3 pct. This would mean a minor inflation rate for the year, even below the 5-6 pct range frequently forecast for 1984.

Most of the small increase was fueled by a 1.4 pct increase in consumer food prices, offset in part by decreases in energy prices.

Capital equipment prices, however, also rose slightly during July—by 0.2 pct. These items represent 22.2 pct of the total producer price index.

The rise was spread through the capital equipment field, ranging from a modest 0.1 pct gain for such diverse items as automobiles, and pumps and compressors to sharp increases of 1.6 pct for ball and roller bearings and 1.4 pct for heating equipment.

Slight decreases from June—0.1 pct—were registered in valves and fittings and miscellaneous metal products.

According to several analysts, the continued strength of the dollar plays a key role in the low inflation rate, forcing U.S. producers to keep prices low to compete with inexpensive imported products.

The producer price index for finished goods rose 0.3 pct in July from June, after seasonal adjustment. However, prices of intermediate goods—those requiring further processing—fell by 0.2 pct, indicating that further price increases in the next few months will continue to be moderate, further fueling a steady economic growth without high inflation.

Some analysts see slightly higher increases in producer prices after Labor Day, but most are still predicting that the overall inflation rate will be under 4 pct for the year.

Latest Month Covered: July 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	384.1	+ 0.2	+ 2.0
Metal Forming Machine Tools	425.2	+ 0.3	+ 2.2
Agricultural Machinery & Equip.	337.2	+ 0.1	+ 3.1
Construction Machinery & Equip.	358.2	0	+ 1.5
Industrial Process Furnace & Ovens	374.4	0	+ 3.3
Industrial Material Handling Equip.	289.0	+ 0.1	+ 1.5
Pumps, Compressors & Allied Equip.	349.9	+ 0.1	+ 0.6
Fluid Power Equip. (Dec. 1970 = 100)	260.3	+ 0.6	+ 2.7
Mechanical Power Transmission Equip.	326.4	+ 0.8	+ 3.6
Automobiles	221.1	+ 0.1	+ 1.7
Motor Trucks—Light	282.4	0	+ 4.6
Motor Trucks—Heavy	334.7	0	+ 6.8
Railroad Equipment	363.4	+ 0.6	+ 3.4
Fabricated Metal Structural Products	311.6	+ 0.2	+ 3.1
Electric Motors	340.3	0	+ 1.6
Valves & Fittings (Dec. 1982 = 100)	101.9	− 0.1	+ 2.0
Ball & Roller Bearings	343.3	+ 1.6	+ 3.6
Cutting Tools & Accessories	278.6	+ 0.3	+ 1.1
Heating Equipment	254.7	+ 1.4	+ 4.0
Plumbing Fixtures & Brass Fittings	302.5	+ 0.2	+ 4.2
Metal Containers	348.4	+ 0.1	+ 3.5
Miscellaneous Metal Products	294.1	− 0.1	+ 3.7

Data based on U.S. Labor Dept.'s Producer Price Index

NOTE

ONLY THE FOLLOWING PAGES OF THIS

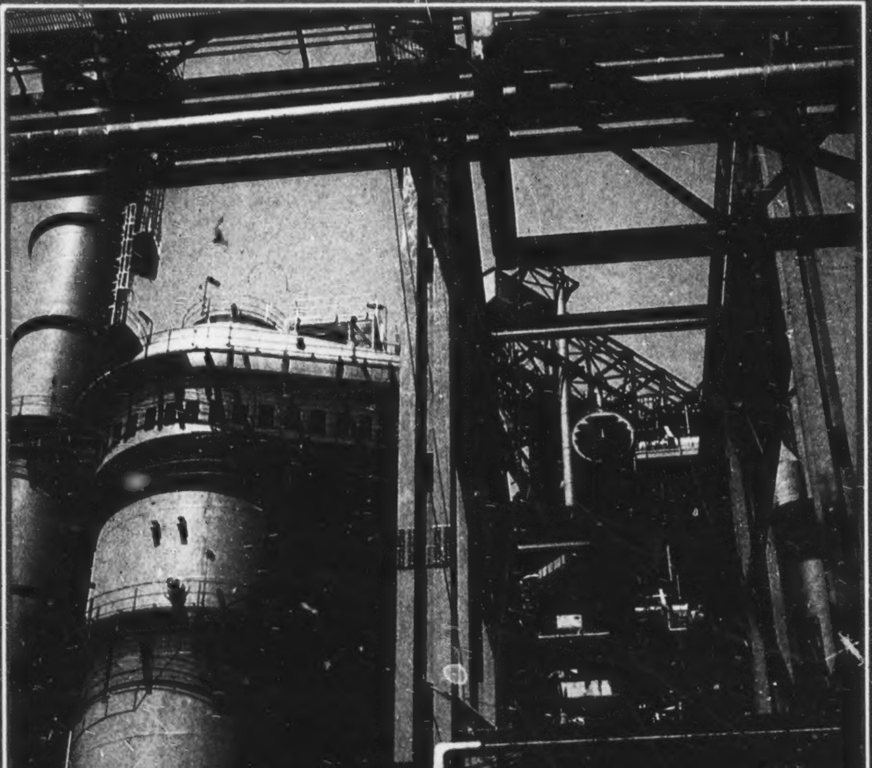
PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 3, 21, 27, 30,

86, 89, 92.

C2150-2

CHILTON'S
IRON AGE
September 17, 1984



C12286413 1CK 0 JUN88
CONGRESSIONAL INFO SERV SCF
SRI ACQUISITIONS
4520 EAST WEST HWY S 800
BETHESDA MD 20814

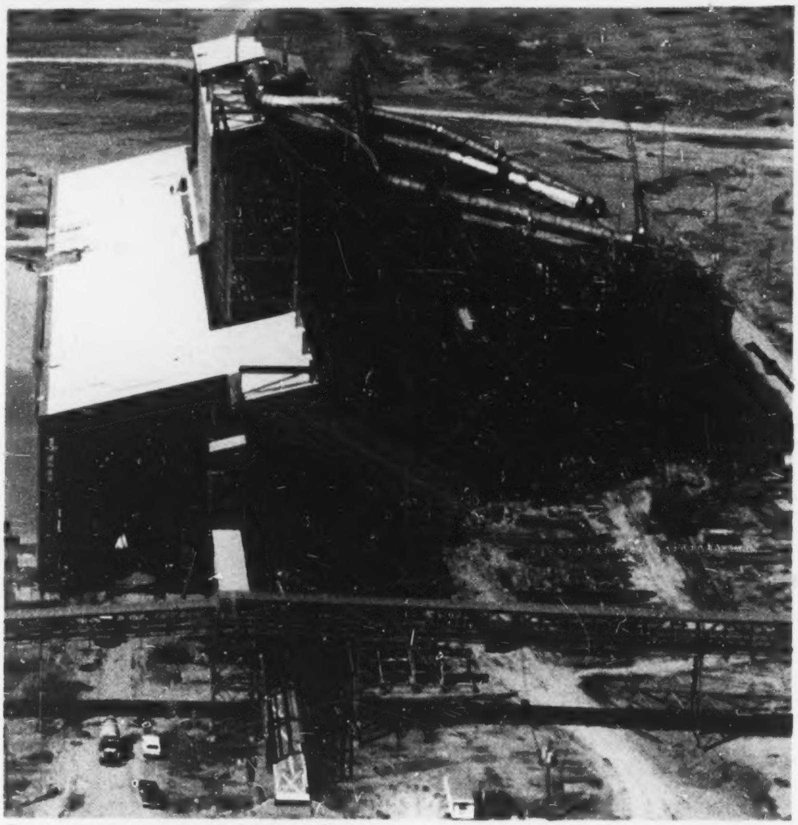
HOW CAPITAL SPENDING IS MAKING STEEL MORE COMPETITIVE

Plus
A Review of Project Startups

And
Plant Shutdowns

SEPTEMBER 17, 1984 VOL. 227, NO. 18

CHILTON'S IRONAGE METALS PRODUCER



Cover photo courtesy of Inland Steel.

Editorial 5
You want issues? I'll give you issues!

Newswatch 19
Businesses are at odds over tax reform proposals in California.

The Hot Spot 27
Japan: AISI critique of CBO report inaccurate.

Steel Construction 32
There's a quiet and determined push to modernize a smaller production complex, as indicated in this most complete examination of the steel industry's expansions and shutdowns.

in-Plant Spotlight 61
Three new developments in continuous casting.

Technically Speaking 65
Japan produces weldable high strength steel.

Materials Report 82
Steelmakers look for an end to the long summer slump.

Order Trends 92
Durable orders post a small rise.

Next Issue: High-strength steel is sidetracked but not roadblocked.

Departments

EDITORIAL STAFF **6**
SIGNED, SEALED AND DELIVERED **11**
INDUSTRIAL BRIEFS **24**
PERSONNEL TOUCH **69**
PRODUCT & EQUIPMENT REVIEW **70**
MANAGEMENT SERVICE CARD **83**
BUSINESS STAFF **84**
AD INDEX **85**
P&P DATA 8/27 **86**
FERROUS SCRAP 8/27 **89**
CLEARING HOUSE **90**

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $49 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

The arrangement would mark the first time a Japanese company would have a direct stake in the American aluminum industry.

Martin Marietta's Torrance facility has developed several proprietary melting and casting techniques.

Titanium and aluminum extrusions are produced there, along with aluminum forgings for the automotive and commercial aerospace markets.

Martin Marietta, which is based in Bethesda, Md., employs nearly 1,600 at the Torrance facility. The plant was expanded several years ago before the civilian aerospace slump of 1982 and 1983 from which the industry just recently has begun to recover.

Product orders from the automotive and other transportation industries have helped compensate for the commercial aerospace decline, but there has been speculation in some circles that Martin Marietta might be interested in selling the facility.

But the latest announcement seems likely to put those rumors to rest. It also is likely to again underscore the continued internationalization of California's basic industries.

Car imports already capture more than 50 pct of the market in the state, and General Motors is scheduled to join with Toyota later this year to jointly produce a new, small car at Fremont, Calif. near San Francisco.

Integrated steel manufacturers also have fallen victim to lower-priced foreign competition, and Kawasaki Steel Corp., another Japanese steelmaker, has a stake in the Kaiser Steel plant at Fontana, Calif., near Los Angeles.

World steel output up in first half; U.S. and Latin America post best gains

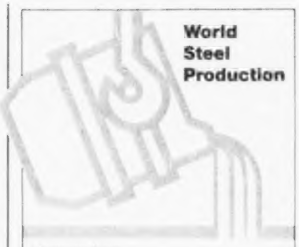
Raw steel output in the Free World was up 9.5 pct during the first six months of 1984 compared to the same period a year earlier, the International Iron and Steel Institute (IISI) reported.

The U.S. posted the best gain for the first half with a 27.9 pct increase, from 36.3 million metric tons in first six months of 1983 to 46.5 million metric tons in the first half of this year. Production sagged in July and August, but American steelmakers expect demand to rebound later in the year after the U.S. automakers resolve a new labor agreement with their unionized workers.

(Another factor that could affect on the American steel market is President Ronald Reagan's decision on the Bethlehem Steel Corp.—United Steelworkers of America petition for protection from imports. Mr. Reagan is scheduled to act on the U.S. International Trade Commission's recommendation for a combination of quotas and tariffs on Sept. 24—six weeks before the U.S. voters go to the polls.)

Production in Japan rose to 52.1 million metric tons, an 11.5 pct gain, in the first half compared to 46.7 million tons in same period of 1983. Steel makers in the European Economic Community (EEC) saw a similar percentage gain, with raw steel output totalling 60.8 million tons in the first six months of this year compared to 54.6 million tons in the first half of last year.

Latin American steel producers, meanwhile, posted a 21.1 pct increase in production for the first half of 1984, to almost 16.2 million tons from 13.3 million tons in the first half of 1983.



January-June

(In Thousands of Metric Tons)

	1983	1984	Pct Change
EEC	54,610	60,822	11.4
USA	36,348	46,483	27.9
Japan	46,733	52,128	11.5
Others	54,896	62,538	13.9
Total	192,587	221,971	15.3

Source: IISI

According to the Instituto Latinoamericano del Fierro y el Acero (ILAFA), the region's steel industry could surpass its 1980 production record of more than 30 million tons in 1984 if output continues at the current pace.

Though production may be up, ILAFA said, the outlook for the region's industry remains clouded.

Insurance exec may purchase Bethlehem's Seattle plant

The story was a familiar for the West Coast's basic industries. The aging Bethlehem steel plant in West Seattle has been on the market for two years since the parent company decided to end West Coast steel production. But with the West Coast steel trade battered by foreign imports from Japan, South Korea and other markets, there were few takers.

Now the story may have a surprisingly happy ending.

Carl Meitzen, a local insurance executive, said in mid-August that he has signed an agreement to purchase the facility for $100 million. He plans to keep the furnaces open and the steel plant's 750 workers on the payroll. But Mr. Meitzen does plan to negotiate contract concessions with the United Steelworkers of America, which represents many employees at the plant.

The deal, described as the largest of its kind in the Pacific Northwest, still depends on the willingness of several banks to make loans to finance the purchase. But Mr. Meitzen told reporters the transaction is "99.5 pct" certain and that he expects to take over operations on Sept. 28.

The contract signing was witnessed by Washington Gov. John Spellman.

Mr. Meitzen is a Texas native and owner and chairman of C.E.M. Associates, a holding company based in Illinois that deals primarily with insurance. He has no previous experience with the steel industry. But he says he was looking for property in Seattle for commercial development when he became aware of the plant's availability. He believes with lower wage rates and upgraded equipment the facility can be profitably managed.

Mr. Meitzen will rely on the present staff to maintain operations. Bethlehem has indicated it would cost about $15 million to modernize the facility and make it competitive. The new owner says he's willing to spend the money, which would be used for installation of a continuous-caster.

The Bethlehem property spans 135 acres and includes a primary steel plant, a fabricating plant and an industrial-fastener facility. The plant was built in 1905

JAPAN: AISI CRITIQUE OF CBO REPORT INACCURATE

In recent statements, especially in the July 15 issue of the its "Steel Comments" and July 20 "Critique" of the Congressional Budget Office statement on quota legislation, the American Iron and Steel Institute (AISI) provided inaccurate information on the Japanese steel trade issues. The Japan steel industry takes issue with these statements and wishes to set the record straight.

The AISI stated: "The Japanese like to express their concern for rising U.S. protectionism, but today when Japanese imports still account for less than 5 pct of domestic consumption, Japanese import policies are becoming even stricter.

"Subsidization . . . has been combined with a substantial closure of their own markets to foreign competition . . . to effectively insulate the Japanese market from imported products."

Nothing could be further from the the truth. In the first six months of 1984, steel imports into Japan were almost 2.5 million net tons, and accounted for 7 pct of all the steel consumed in Japan. In the full year 1983, imports were a record 3 million tons.

Over 90 pct of these imports came in duty-free under the GATT provision for special treatment for all developing countries. In contrast, the U.S. excludes all steel imports from developing countries from the GATT provision.

The foreign share of the Japanese market is low (actually 7 pct, not 5 pct) because Japan is more competitive with imports on most product lines. Japanese imports are concentrated in two commercial grades, hot-rolled coil and plate, where they make up more than 60 pct of the apparent consumption in the distributor/service center market.

The inference that the industry receives subsidies is totally incorrect. Every study done by the U.S. government agencies, and even by AISI's contracted firm, Putnam, Hayes & Bartlett, indicate no subsidization.

The AISI commented that Japanese banks provided "preferential access to cheap and plentiful investment capital . . . for modernization and expansion in the 1950s and 1960s."

Our response to that is that loans from government financial institutions accounted for 10 pct of the total supply of funds, at somewhat lower interest rates, during the post-War period up to 1955, but that percentage decreased conspicuously thereafter. In the period 1956—70, less than 0.5 pct of loans came from government institutions.

Regarding labor productivity, the AISI said that " The U.S. steel industry ranks with Japanese producers at actual operating rates for carbon steel production by integrated producers."

Productivity is a very complicated issue and much depends upon the methodology used. However, every expert other than the one cited (World Steel Dynamics) has found the Japanese to be more productive.

The AISI commented that Japanese steel producers have dumped seamless pipe and tube at unfair trading margins of about 23 pct and stainless clad plate at a margin of 14 pct.

Apparently the AISI was referring to the 1983 Babcock and Wilcox case in connection with seamless special tube production and another case involving the clad product, which was not produced by a major integrated Japanese steelmaker. The combined tonnages of these products into the U.S, has been less than 1 pct of total Japanese shipment to the U.S. The final conclusion in the seamless case was no dumping margin and in clad, a margin of 2 pct.

The AISI reaffirms that the American steel industry has said in the past that "Fairly traded steel imports are not the issue. The real issue concerns imports that violate U.S. trade laws."

The Japanese steel industry agrees but disagrees with a campaign that raises the specter of unfair Japanese trading activities when none exists.

(For another view, see p. 30.)

Four statements made by the AISI are challenged by the Japanese steel industry, with their views explained as to why they disagree.

American Steel Imports
(000, Short Tons)

	Total From All Exporters	Total From Japan
May '84	1,998	551
Pct Change	−10.6	−21.3
June '84	1,785	434
Pct Change	+37.7	+74.7
June '83	1,297	248

Source: AIIS, 7/84

Based on a statement issued by the Japan Steel Information Center in response to statements made by the AISI.

AISI: CBO ANALYSIS FLAWED BY INACCURACIES

Due to unsupported conclusions and incorrect interpretations, the CBO document is said to be useless by the AISI.

American Steel Imports
(000, Net Tons)

Exporters	Six Months 1984	Six Months 1983
Total	12,466	7,200
Canada	1,684	1,110
Latin America	1,683	872
EEC	2,668	1,782
Other, Europe	1,567	473
Asia	4,451	2,608
Others	413	356
Japan	3,219	1,748

Source: AISI, 7/84

The critique of proposed steel import quota legislation released by the Congressional Budget Office (CBO) of the U.S. Federal Government contains inaccuracies, incorrect interpretations of data and unsupported conclusions. As a result, the CBO document is not a useful contribution to the current debate over the need for import quotas and their effects on the American economy. In our opinion the CBO vastly exaggerates the effects on steel prices; its analysis proceeds as if it were describing a worldwide market-driven steel industry, which is totally incorrect.

CBO's major omission is its failure to acknowledge that over the past 15 years foreign governments have provided $40–50 billion of subsidies to their steel industries and are still providing such subsidiaries.

Foreign government subsidies have permitted inefficient and unprofitable firms abroad to expand steel production. Excess capacity outside the U.S. is estimated to be at least 200 million tons. The result has been a breakdown in the international steel trade market mechanism.

While the CBO points out the declining use of steel per unit of GNP in the U.S., it fails to point out that this is true of all industrial countries. And it ignores that almost all other countries have been expanding steel capacity in the face of known decline.

The CBO fails to recognize that steel consumption in the U.S. (until the 1982—83 recession) has been steady and that demand has gradually shifted to higher-value, lighter, higher-strength and treated steels.

The CBO fails to acknowledge that the product range of mini-mills is still narrow, that the mini-mills have also taken market share from imports, and that mini-mills have not been a major factor in what CBO calls the "deteriorating performance" of basic steel.

CBO estimates of price increases in the near term, either with or without quotas, as being "so high compared with present price levels as to be totally inconsistent with those of most analysts." The CBO's projected profit potential is so great that were it true, the profits would solve the entire steel industry's problem of capital for mill modernization. CBO's result is totally inconsistent with real world expectations.

The CBO fails to recognize the costs of foreign steel to the U.S. economy. Imports which exceeded 15 pct (the quota bill market-share for imports) in 1983 resulted in: Steel industry shipments lost, 4.6 million tons; steel industry sales lost, $2.3 billion; total impact on GNP, $5.1 billion; government taxes lost, $1.1 billion; unemployment benefits paid, $350 million; jobs lost, direct and indirect, 62,000 persons.

An analysis by the Congressional Research Service shows the benefits to the national economy of: Increased steel industry sales, $12.8 billion; total impact on GNP, $28 billion; increased taxes collected, $6.1 billion; increased jobs, direct and indirect, 119,000 persons.

The CBO fails to acknowledge that each job in steel creates 2.3 other jobs.

We challenge its contention that U.S. industry can no longer compete in its home market. Independent studies show that there has been a reduction of $100 a ton in pre-tax costs since 1982, a factor that has largely been ignored.

The CBO criticism of U.S. steel industry investments does not acknowledge that for two decades the industry has invested substantially more in steel facilities than its cash flow from steel.

CBO is pretending that the world steel market has functioned in the past as it should, allocating capital and rewarding the relatively efficient with adequate profits and stable employment. It is not.

Based on a statement released by the American Iron and Steel Institute to set the record straight regarding the CBO critique of proposed steel import quota legislation and the effect on steel prices.

Reprints available while supply lasts. For single copy, circle No. 95 on Inquiry Card. Additional copies, $1, for articles up to eight pages. Longer ones $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write: IRON AGE, Reader Service, Chilton Company, Radnor, PA 19089. Ask for Reprint No. 1085.

PRICE & PRODUCTION DATA

(Effective August 27, 1984)

Steel production by districts, thousands of tons (000 omitted)	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	180	168	215	178
Pittsburgh	222	235	247	209
Youngstown	72	75	89	96
Lake Erie	114	113	109	132
Detroit	150	162	156	111
Chicago	410	421	452	467
Cincinnati	93	90	86	86
St. Louis	49	73	77	72
Southern	164	159	186	149
Western	68	74	78	89
U.S. Production	1,523	1,570	1,695	1,623

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective August 27, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,523	1,570	64,437	52,627
Capability Utilization Rate	59.0	60.8	73.2	53.5

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.582	26.217
Pig Iron** (Net ton= 2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 82.50	$ 82.50	$ 81.50	$ 76.17
No. 2 bundles	$ 51.50	$ 51.50	$ 50.83	$ 45.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 87.50	$ 87.50	$ 86.50	$ 82.50
No. 1 steel, Philadelphia	81.50	81.50	80.50	68.50
No. 1 steel, Chicago	78.50	78.50	77.50	77.50
No. 1 bundles, Detroit	70.50	70.50	70.50	73.50
Low Phos., Youngstown	80.50	80.50	80.50	79.50
No. 1 mach'y cast., Pgh	71.50	71.50	71.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi	115.50	115.50	115.50	109.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective August 27 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	50.66	52.02	8/27/84
Copper (C)	66.00-	65.00-66.00	8/24/84
Lead	28.00-32.00	28.00-34.00	8/6/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	213.51	213.67	8/27/84
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	48.00-50.00	48.00	8/14/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$130.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$348.00
Indium, dollars per troy oz.	$3.30
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$293-$310
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$139
Platinum, per troy oz.	$343
Rhodium, per troy oz.	$700
Silver ingots, per troy oz.	$7.57
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Aug. 20—567.64
Aug. 21—567.64
Aug. 22—567.64
Aug. 23—568.16
Aug. 24—568.03

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	58½	57½
Yellow brass	55	54½
Red brass	55¾	55¼
Comm. bronze	56⅜	55½
Mang. bronze	58¼	50
Free cutting rod ends	60	59

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	46
Light copper	37

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	51
No. 2 copper wire	42
Light copper	33
No. 1 composition	53
No. 1 comp. turnings	51
Hvy. yellow brass solids	35
Hvy. yellow brass turnings	33
Radiators	40

Aluminum

New mixed clips	37	—38
Old sheet	35	—36
Old cast	35	—36
Clean dry borings	36	—37

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	35	—36
Mixed L.C. clips	32	—33
Old sheets and cast	28	—29
Borings and turnings	21	—22
Duraluminum clippings	27	—28

Copper and Brass

No. 1 copper wire	46	—47
No. 2 copper wire	38	—39
Light copper	34	—35
Radiators	33	—34
No. 1 composition	42	—43
No. 1 composition turn'gs	39	—40
Cocks and faucets	30	—31
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	43	—44

Lead

Heavy soft lead	10	—11
Whole batteries	3	— 4
Type metal	16	—17
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE AUG. 27, 1984

(Effective August 27, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 87.00 to	$ 88.00
No. 2 hvy. melting	77.00 to	78.00
No. 1 dealer bundles	98.00 to	99.00
No. 1 factory bundles (auto)	90.00 to	91.00
No. 2 bundles	53.00 to	54.00
No. 1 busheling	104.00 to	105.00
Machine shop turn.	12.00 to	13.00
Shoveling turnings	49.00 to	50.00
Cast iron borings	48.00 to	49.00
Low phos. punchings plate	104.00 to	105.00
Heavy turnings	76.00 to	77.00
No. 1 RR hvy. melting	92.50 to	93.50
Rails 2 ft. and under	113.00 to	114.00
Scrap rails, random lgth.	99.00 to	100.00
RR specialties	105.00 to	106.00
No. 1 machinery cast	71.00 to	72.00
Cupola cast	64.00 to	65.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	550.00 to	560.00
18-8 turnings	450.00 to	460.00

Chicago

No. 1 hvy. melting	$ 78.00 to	$ 79.00
No. 2 hvy. melting	71.00 to	72.00
No. 1 dealer bundles	93.00 to	94.00
No. 1 factory bundles (auto)	87.00 to	88.00
No. 2 dealer bundles	49.00 to	50.00
No. 1 busheling	92.00 to	93.00
Shredder scrap	90.00 to	91.00
Machine shop turn.	42.00 to	43.00
Mixed bor. and turn.	43.00 to	44.00
Shoveling turnings	47.00 to	48.00
Cast iron borings	47.00 to	48.00
Low phos. forge crop	111.00 to	112.00
Low phos. punchings plate ¼ in. and heavier	121.00 to	122.00
Low phos. 2 ft. and under	116.00 to	117.00
No. 1 RR hvy. melting	83.00 to	84.00
Scrap rails, random lgth.	89.00 to	90.00
Reroller rails	108.00 to	109.00
Rails, 2 ft. and under	113.00 to	114.00
RR couplers and knuckles	97.00 to	98.00
RR car axles	129.00 to	130.00
No. 1 machinery cast	115.00 to	116.00
Cupola cast	102.00 to	103.00
Stove plate	99.00 to	100.00
Steel car wheels	103.00 to	104.00
Stainless		
18-8 bundles and solids	490.00 to	500.00
18-8 turnings	420.00 to	430.00
430 bundles and solids	120.00 to	125.00
430 turnings	80.00 to	90.00

Philadelphia

No. 1 hvy. melting	$ 80.00 to	$ 83.00
No. 2 hvy. melting	70.00 to	73.00
No. 1 dealer bundles	95.00 to	98.00
No. 2 dealer bundles	50.00 to	53.00
No. 1 busheling	95.00 to	98.00
Shredder scrap	98.00 to	101.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	40.00 to	43.00
Low phos. 5 ft. and under	92.00 to	95.00
Low phos. 2 ft. punchings	115.00 to	118.00
Electric furnace bundles	101.00 to	104.00
RR specialties	98.00 to	101.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	72.00 to	75.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 51.00 to	$ 52.00
No. 2 hvy. melting	50.00 to	51.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	35.00 to	36.00
No. 1 busheling	69.00 to	70.00
Drop forge flashings	43.00 to	44.00
Machine shop turn.	45.00 to	46.00
Mixed borings and turn.	23.00 to	24.00
Shoveling turnings	46.00 to	47.00
Cast iron borings	36.00 to	37.00
Heavy breakable cast	38.00 to	39.00
Mixed cupola cast	54.00 to	55.00
Automobile cast	77.00 to	78.00
Stainless		
18-8 bundles and solids	445.00 to	455.00
18-8 turnings	350.00 to	360.00
430 bundles and solids	100.00 to	110.00

Youngstown

No. 1 hvy. melting	$ 66.00 to	$ 69.00
No. 2 hvy. melting	47.00 to	50.00
No. 1 dealer bundles	79.00 to	82.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turn.	13.00 to	16.00
Shoveling turnings	18.00 to	21.00
Low phos. plate	79.00 to	82.00
Electric furnace bundles	76.00 to	79.00
Galvanized bundles	67.00 to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00 to	$ 63.00
No. 2 hvy. melting	37.00 to	40.00
No. 1 dealer bundles	68.00 to	71.00
No. 1 factory bundles	72.00 to	75.00
No. 2 bundles	19.00 to	22.00
No. 1 busheling	73.00 to	76.00
Machine shop turn.	8.00 to	11.00
Mixed bor. and turn.	8.00 to	11.00
Shoveling turnings	10.00 to	13.00
Cast iron borings	13.00 to	16.00
Cut structural & plates, 2 ft. and under	105.00 to	108.00
Low phos. punchings plate	105.00 to	108.00
Drop forge flashings	42.00 to	45.00
Foundry steel, 2 ft. & under	62.00 to	65.00
No. 1 RR hvy melting	79.00 to	82.00
Rails, 2 ft. and under	105.00 to	108.00
Rails, 18 in. and under	108.00 to	111.00
Steel axle turnings	59.00 to	62.00
Railroad cast	92.00 to	95.00
No. 1 machinery cast	102.00 to	105.00
Cupola cast	58.00 to	61.00
Stove plate	44.00 to	47.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	56.00 to	57 00
No. 1 busheling	79.00 to	80.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 bundles	37.00 to	38.00
Machine shop turn.	14.00 to	15.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	22.00 to	23.00
Low phos. plate	95.00 to	96.00
Structural and plate, 2 ft. and under	96.00 to	97.00
Rails, 2 ft. and under	94.00 to	95.00
Scrap rails, random lgth.	74.00 to	75.00
No. 1 machinery cast	79.00 to	80.00
No. 1 cupola cast	59.00 to	60.00

St. Louis

No. 1 hvy. melting	$ 66.00 to	$ 67.00
No. 2 hvy. melting	55.00 to	56.00
Foundry steel, 2 ft.	66.00 to	67.00
No. 1 dealer bundles	66.00 to	67.00
No. 2 bundles	54.00 to	55.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	23.00 to	24.00
Cast iron borings	27.00 to	28.00
No. 1 RR hvy. melting	66.00 to	67.00
Rails, random length	70.00 to	71.00
Rails, 18 in. and under	89.00 to	90.00
RR specialties	85.00 to	86.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	50.00 to	51.00
Stove plate	83.00 to	84.00
Steel car wheels	97.00 to	98.00
Rerolling rails	80.00 to	81.00
Unstripped motor blocks	56.00 to	57.00

Birmingham

No. 1 heavy melting	$ 73.00 to	$ 74.00
No. 2 heavy melting	65.00 to	67.00
No. 1 dealer bundles	73.00 to	74.00
No. 2 bundles	52.00 to	53.00
No. 1 busheling	73.00 to	74.00
Shredder scrap	93.00 to	94.00
Machine shop. turn.	26.00 to	27.00
Shoveling turnings	40.00 to	41.00
Cast iron borings	40.00 to	41.00
Electric furnace bundles	64.00 to	65.00
Elec. furnace, 3 ft. & under	71.00 to	72.00
Structural and plate, 2 ft.	97.00 to	98.00
Structural and plate, 4 ft.	87.00 to	88.00
No. 1 RR hvy. melting	87.00 to	88.00
Scrap rails, random lgth.	82.00 to	83.00
Rails, 2 ft. and under	102.00 to	103.00
Angles and splice bars	87.00 to	88.00
No. 1 cupola cast	84.00 to	85.00
Unstripped motor blocks	67.00 to	68.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00 to	$ 60.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	71.00 to	72.00
No. 2 bundles	33.00 to	34.00
Machine shop turn.	5.00 to	6.00
Shoveling turnings	7.00 to	8.00
Cast iron borings	20.00 to	21.00
Low phos. 18 in. and under	88.00 to	89.00
Rails, random length	71.00 to	72.00
Rails, 2 ft. and under	87.00 to	88.00
No. 1 cupola cast	60.00 to	61.00
Heavy breakable cast	27.00 to	28.00
Drop broken cast	81.00 to	82.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 65.00 to	$ 66.00
No. 2 hvy. melting	55.00 to	56.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	39.00 to	41.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	75.00 to	77.00
Machine shop turn.	14.00 to	16.00
Shoveling turnings	22.00 to	24.00
No. 1 machinery cast	85.00 to	90.00
Mixed cupola cast	48.00 to	50.00
Heavy breakable cast	14.00 to	15.00

San Francisco

No. 1 hvy. melting	$ 45.00 to	$ 47.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	35.00 to	37.00
No. 2 dealer bundles	17.00 to	18.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	81.00 to	83.00

Los Angeles

No. 1 hvy. melting	$ 46.00 to	$ 48.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 dealer bundles	36.00 to	38.00
No. 2 dealer bundles	17.00 to	19.00
Machine shop turn.	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 70.00 to	$ 72.00
No. 2 hvy. melting	59.00 to	61.00
No. 2 bundles	41.00 to	43.00
No. 1 cupola cast	94.00 to	95.00
Mixed yard cast	84.00 to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 90.00
No. 2 heavy melting cut 2 ft. and under	84.00
No. 1 dealer bundles	92.00
No. 2 bundles	48.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	92.00
Bush. new fact. unprp'd.	82.00
Machine shop turn.	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	73.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to	$ 74.00
No. 2 hvy. melting	59.00 to	60.00
No. 2 bundles	42.00 to	43.00
Machine shop turn.	16.00 to	17.00
Crushed turnings	34.00 to	35.00
Shredder scrap	78.00 to	79.00
Cut structural plate, 2 ft. and under	100.00 to	102.00
Cut structural plate, 5 ft. and under	87.00 to	89.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	75.00 to	76.00

Copyright 1984 Iron Age Magazine

DURABLE ORDERS POST SMALL RISE

The predictable up and down movement of the economy moved up in one significant area in July—new orders for manufactured goods.

July new orders for durable goods rose fractionally—0.7 pct—to $100.5 billion after dropping in June. Durable goods industries are said to be on a roller coaster, but analysts doubt that the ups and downs are large enough to affect the economy negatively.

Capital goods orders in non-defense industries in July dropped for the second consecutive month while the defense industries' segment rose again. In the latter category, defense industries' orders rose 1 pct in July to $7.1 billion. Non-defense capital goods orders, a key indicator of business investment plans, declined 3.7 pct to $27.1 billion vs. June's $28.1 billion. In May such orders jumped a whopping 10.4 pct.

In metalworking, there were dramatic rises in July. Total machine tool orders rose 63 pct to $313.4 million compared with June's $191.8 million. Within that category, metalforming tools orders rose 192 pct to $177.6 million compared with the previous month's $60.8 million. Metalcutting machine tools orders were up 3.7 pct to $135.9 million compared to $131.0.

Primary metals new orders rose slightly—2.8 pct—to $10.9 billion. The increase broke a string of drops that had occurred in six of the previous seven months. There was no change in steel orders while iron and steel casting and nonferrous metals were up.

Transportation equipment orders were up $1.1 billion or 4.6 pct to $25.2 billion, the strongest showing since March.

Of the 26 categories shown, 15 were up in July compared with June, nine were down and two were unchanged. Economists interpret this as a further sign the economy is slowing, but not dramatically so. This year the orders pace has been slower, with declines posted in April and June.

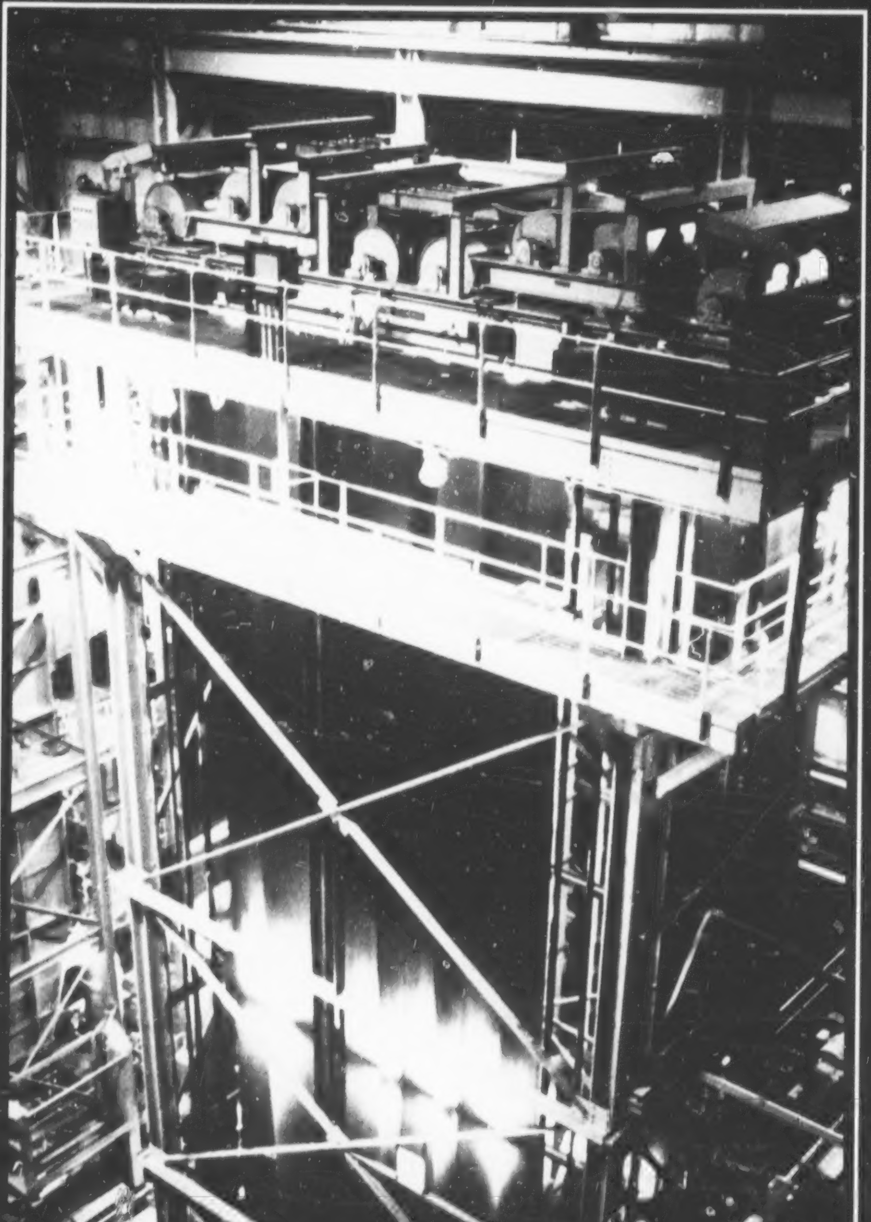
Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	2nd Qtr.	$303.8	$332.7	$302.2
Manufacturing, Total	2nd Qtr.	126.0	124.7	111.3
Manufacturing, Durable Goods	2nd Qtr.	58.3	59.2	50.9
Mining Industry	2nd Qtr.	13.3	13.6	14.6
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	July	100.5	99.8	87.7
Shipments	July	97.8	99.2	85.6
Inventories	July	184.5	182.3	169.7
Unfilled Orders	July	347.5	345.3	307.5
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	July	27.1	28.1	21.6
Capital Goods Producers, Defense Industries	July	7.1	7.0	6.7
Primary Metals, Total	July	10.9	10.6	10.3
Steel (SIC 331)	July	4.5	4.5	4.2
Iron & Steel Castings (SIC 332)	July	1.3	1.2	1.0
Nonferrous Metals	July	5.1	4.9	5.1
Nonelectrical Mach.-Equip. Industries, Total	July	17.6	18.5	14.8
Engines & Turbines	July	2.0	1.5	0.9
Farm Machinery & Equipment (Shipments)	July	0.8	0.9	0.9
Construction, Mining & Mat. Hdlg. Equip.	July	2.9	3.0	2.5
General Industrial Machinery	July	1.4	1.5	1.2
Fluid Power Equipment** (Index-1972=100)	July	259.0	276.0	223.0
Metalworking Machinery	July	0.9	0.8	0.7
Machine Tools, Total ($ Mill., Unadjusted)***	July	313.4	191.8	173.4
Machine Tools, Metalcutting***	July	135.9	131.0	127.0
Machine Tools, Metalforming***	July	177.6	60.8	46.4
Electrical Mach. & Equip. Industries, Total	July	16.2	16.1	14.5
Elec. Transmission Equip. & Ind. Apparatus	July	1.9	2.0	1.7
Household Appliances	July	1.5	1.5	1.3
Communication Equipment	July	5.0	5.7	4.2
Transportation Equip. Industrial, Total	July	25.2	24.1	20.4
Motor Vehicles & Parts (Shipments)	July	15.7	15.3	12.4
Aircraft, Missiles & Parts	July	8.2	7.2	5.2
Shipbuilding & Military Tanks	July	0.6	0.9	1.7
Fabricated Metal Products, Total	July	10.9	11.1	9.9
Instruments, Total	July	5.0	4.9	4.5

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

[illegible]

CHILTON'S
October 1, 1984

IRONAGE
METALS PRODUCER



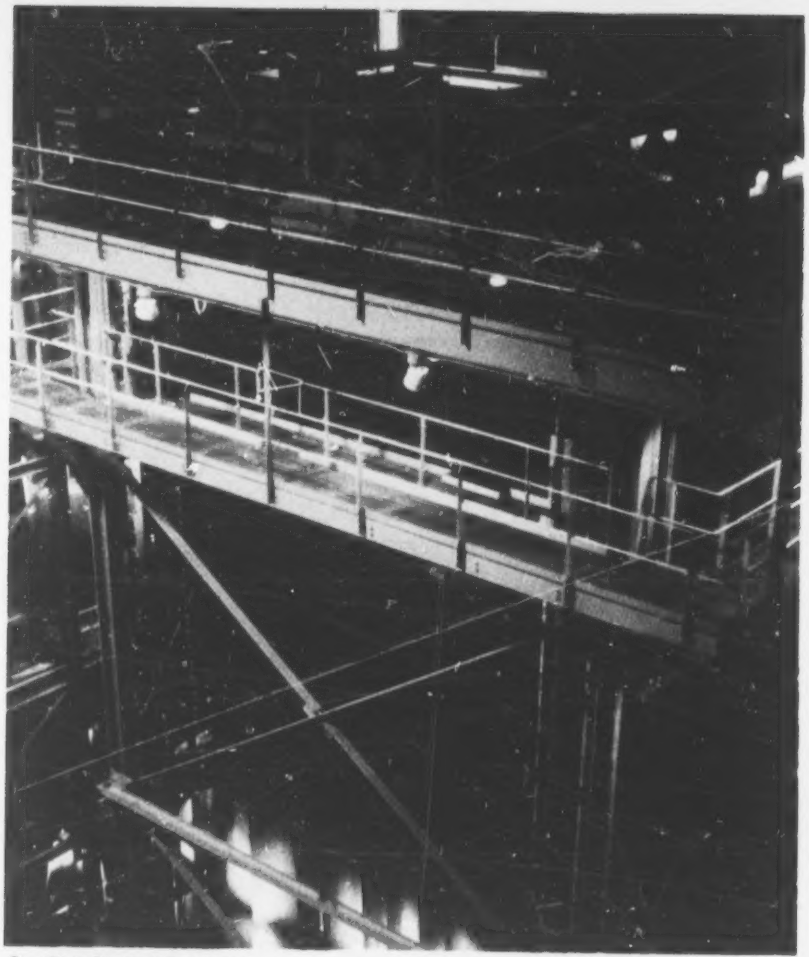
HIGH STRENGTH STEEL SIDETRACKED, BUT NOT ROADBLOCKED

4th Quarter Forecast: Does The Recovery Have Staying Power?

Are Our Nuclear Power Plants Cracking Up?

OCTOBER 1, 1984 VOL. 227, NO. 19

CHILTON'S
IRONAGE
METALS PRODUCER



Cover Photo Courtesy Inland Steel Co.

Editorial 7
Now the odds are against the tortoise.

Newswatch 11
Reagan says no to import restriction.

Fourth Quarter Forecast 18
The recovery appears to be hunkering down for a good stay. Few recession-threatening strains exist in the economy. Prices are under control, inventories are in good balance and plant capacities as well as labor supply are more than adequate.

Nuclear Plants 58
Many of them are tarnished by costly intergranular stress corrosion.

High Strength Steel 72
This auto sheet may be sidetracked, but hardly derailed.

Materials Report 81
Investment is 0.5 pct of sales in steel, 1 pct in nonferrous.

Price Trends 88
Producer prices post a moderate 0.1 pct gain.

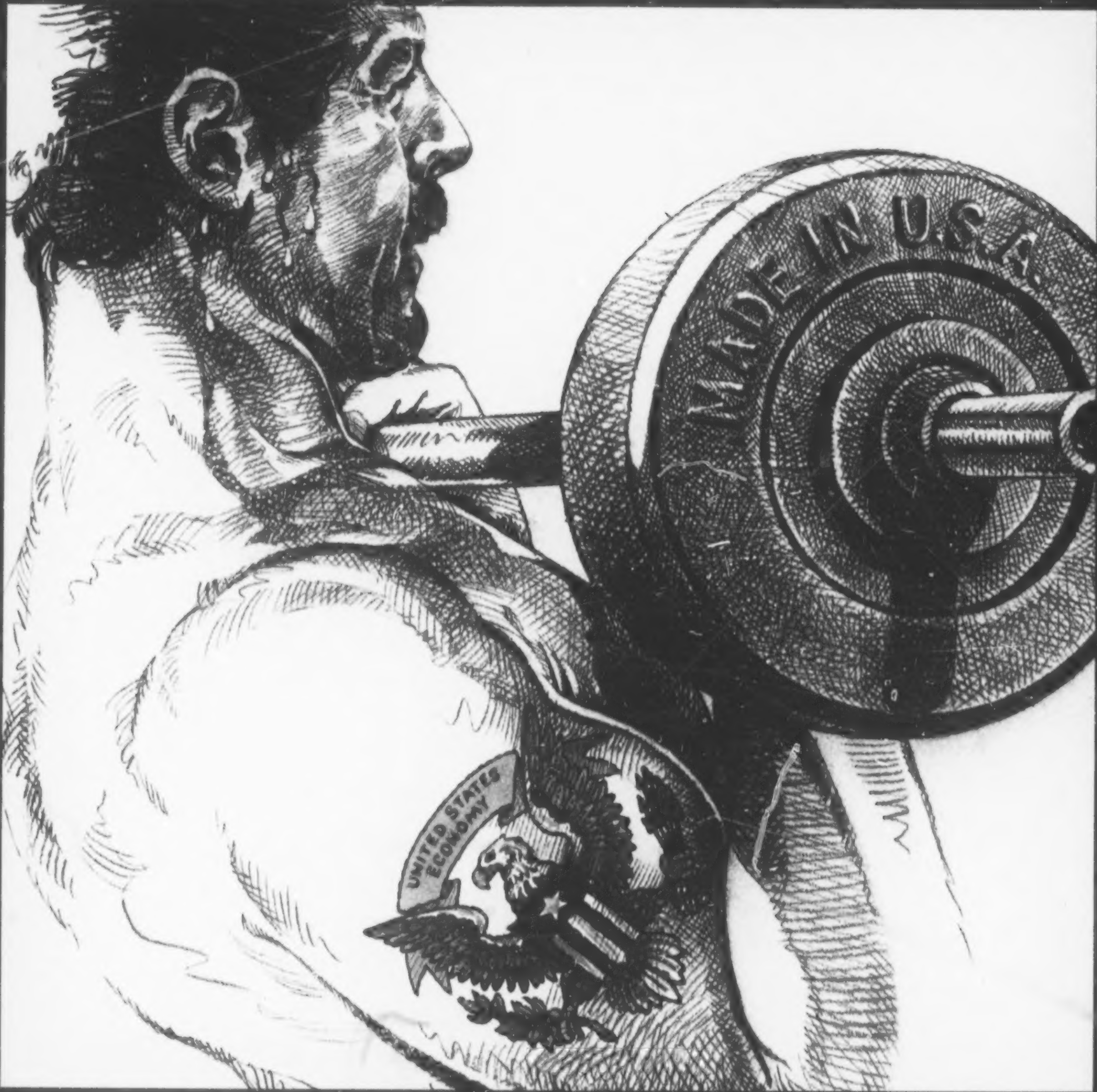
Next Issue: World Steel's Management Challenge.

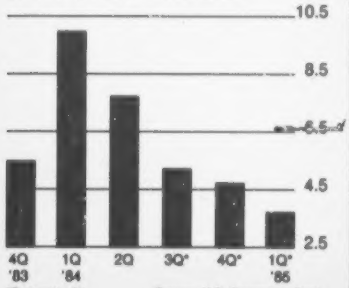
Departments

EDITORIAL STAFF 8
SIGNED, SEALED AND DELIVERED 8
PRODUCT & EQUIPMENT REVIEW 77
AD INDEX 78
MANAGEMENT SERVICE CARD 79
BUSINESS STAFF 80
P&P DATA 9/17 82
FERROUS SCRAP 9/17 83
STEEL PRICES 84
STEEL PRICES 85
CLEARING HOUSE 86

IRON AGE (ISSN 0747-6329) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $42 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077.

4TH QUARTER FORECAST: MORE MUSCLE THAN EXPECTED

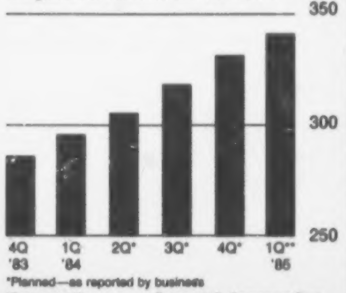




GNP
Pct Increases at Annual Rates, 1972 Dollars

*Forecast—IA

Source: U.S. Commerce Dept.

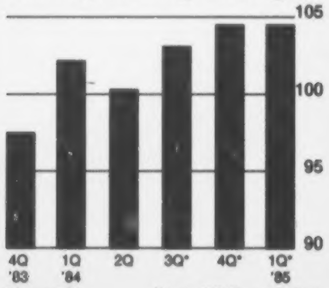


Plant Spending
Billions of Dollars Seasonally Adjusted Annual Rates

*Planned—as reported by business

*Forecast—IA

Source: U.S. Commerce Dept.



New Orders,
Durable Goods Billions of Dollars, Monthly Averages

*Forecast—IA

Source: U.S. Commerce Dept.

BY JOHN BAXTER

The economy has staying power. Several quarters ago when economists were peering through the mist and seeing the edge of a cliff just ahead, they were fooled out of their shoes when the next quarter's growth figures were announced. This happened not just once, but several times.

Slowdown signs are continuing.

And just about everyone seems to find that encouraging. Nobody wants a blowout of good times. Temperance is equated with durability.

The tempering signs are all around.

Growth of the overall economy in the second quarter slowed to a 7.6 pct annual growth pace. That was down from a red-hot 10.1 pct pace in the previous period.

The index of leading indicators was down in July for the second straight month. That's the first time it fell in back-to-back months since early 1982.

New orders received by durable goods producers flip-flopped along a plateau over the three-month, May-July period. As a matter of fact, July orders, at $100.5 billion were well below the $105.2 billion level hit back in March.

Corporate profits in the second quarter were widely viewed as 'disappointing.' They rose $2.3 billion to $152.9 billion on an after-tax basis.

Consumer confidence, too, has turned a pale color. A Conference Board survey stated flatly that consumer confidence leveled off in August.

Most of these trend signs would be expected to appear about now. The recovery is 22 months old, and at that age it can't keep on climbing stairs two steps at a time.

Actually, the slowing pace has come late as far as most economists are concerned. They were calling for lower quarterly growth rates several quarters back.

Now, the name of the game is 'holding on.' As Conference Board analysts put it when announcing their consumer survey, "Expectations (of consumers) have flattened out at an encouragingly high level."

And it seems there are few signs of any actual backsliding taking place in the economy. Hopes for some solid staying power seem reasonable, although some of the hopes have less facts to underpin them than others.

One reason for 'sensing' there is staying power in this recovery, is simply because it's strength and resiliency have been so long under-estimated. Several quarters ago when economists were peering through the mist and seeing the edge of a cliff just ahead, they were fooled out of their shoes when the next quarter's growth figures were announced. This happened not just once, but several times.

Another more readily documented reason for believing the business recovery has staying power, is that no dangerous 'excesses' exist in the economy.

It is excesses that usually put an end to business recovery periods. For one, inventories get too big. That occurs when stocks get out of line with orders and shipments. Then, companies, their stock bins bulging, cut back on their buying. Then the downward spiral starts.

The most recent data on manufacturers' inventory-shipment ratios shows they are in good balance. And the threats of a surging buildup seem to be remote. Ratios have been holding at about 1.45 over the past several months. Compare that to the near-1.70 average ratio for the bad years of 1980-83.

Another excess that has often bumped recovery off the tracks in the past has been strains on plant capacity. But few plants today, even after almost two years of recovery, are busting at the seams—or anything like it. Production-wise, this has been a nice, manageable recovery. One reason is plant operating rates had been so dismally low for so long through 1882 and 1983—down at about 73 pct of capacity.

In July, total industry capacity utilization ran at a 82.5 pct rate. While a good operating rate, it is still comfortably below the pre-recession (1978-79) average rate of 86.6 pct.

Also, there are no excesses in the labor supply situation; the supply is adequate. For example, the unemployment rate among experienced wage and salary workers in July was 6.6 pct. While this jobless rate was down from early-in-the-year rates of about 7.5 pct, the July figure shows there are plenty of experienced workers in the job market. No strain there.

The most important sign of a lack of excesses in the economy is seen, of course, in price restraint. When economists look at the second quarter inflation rate of 3.2 pct (GNP Deflator) holding forth after 22 months of business expansion, they can hardly believe it. Terms used lately by two economists in describing the inflation rate, highlight the point. One said the rate was "simply unbelievable." The other, waxing more poetic, called the rate, "a thing of beauty."

There is another good reason to believe the recovery will hold on—at least through the first half next year. That reason is that this is an election year. The campaigns are underway. And that means simply that no clumsy political hands are likely to tinker with the economic machine until after November.

That economic machine is running pretty smoothly now. And that means that, unfettered by politico-economists it might very likely roll on its own momentum at least through to mid-1985.

As always, there are clouds on the economic horizon that could turn out to be storms moving swiftly towards the now-sunny overhead skies.

At this writing, a strike in the auto industry is a possibility. A strike could impact the economy harder and more quickly than might be guessed. For one, autos have given the recovery a great deal of its zip—the biggest zip of all, in fact.

For another reason, autos are really big users of glass, rubber, metals, textiles, plastics and so on. A sudden stop in autos could cause a supply-line traffic jam that might well lead to posted signs on the recovery road, "highway ends here."

Then, of course, this so-far very suprising recovery could pull one more rabbit out of the hat and take the auto strike in stride. That certainly could be the case if it turned out that any strike was of short duration.

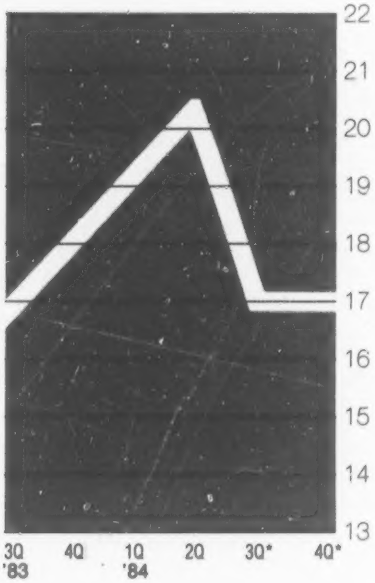
A surprise of surprises could be that this recovery just might run out of surprises. It may have little steam left after posting those red-hot annual rate economic growth pushes of 10.1 pct, 9.4 pct and 7.6 pct that came over the last 5-quarter span of time.

But, on balance, the odds seem good that the business recovery will stay on course. It might be at perhaps a less rousing gallop—or even just a stately trot—right through to at least next June. ☐

STEEL

. . . estimates of steel shipments for 1984 are being lowered again.

Steel Shipments
Millions of Tons



Source: AISI *IA estimate

Foreign steel is the dominant element in the domestic steel picture.

Going into the fourth quarter, imports were blamed for the prolonged lag in the domestic market. Because of the foreign surge, said domestic industry officials, inventory cutting was carrying over to the fourth quarter.

As a result, estimates of steel shipments for 1984 are being lowered again—to about 73 million tons. No one was very hopeful that President Reagan would apply tough controls to foreign shipments.

At the start of the year, domestic producers predicted that imports would be up about 1 million tons from the 17 million tons of 1983. Domestic shipments were expected to rise from 67 million tons to 78 million tons in 1984.

In the first quarter, imports averaged well over 2 million tons a month. The high rate caused concern, but trade specialists said it was a temporary spurt in anticipation of trade curbs. The domestic market was in a strong recovery, so no one was too alarmed.

Imports appeared to be easing in the second quarter. Foreign deliveries fell below 2 million tons in May and below 1.8 million tons in June.

In July, however, imports shot up to more than 2.6 million tons. This record intake came to nearly 33 pct of U.S. supply. The seven-month import total of 15 million tons was up from 8.6 million tons in 1983.

The July import rise coincided with a sharp drop in the orders and shipments of domestic mills. These fell from 6.7 million tons in June to 5.5 million tons in July. There was no domestic pickup in August and shipments of some mills declined in September.

By September, it was clear steel imports could easily reach 25 million tons in 1985. This was 6 million or 7 million tons over earlier estimates and most of the addition was coming at the expense of U.S. producers.

In this setting, domestic steelmakers feared the Reagan Administration would propose a cosmetic program of import control. The agreement that now limits imports from Europe would be left standing. The agreement that supposedly now limits shipments from Japan would be reaffirmed. Orderly marketing agreements would be negotiated with Spain, Korea and Japan.

The Administration could then say it has shielded the domestic steel industry from about 90 pct of its foreign competition. That might be considered true except that voluntary, informal restraints are described by steel men as "rubber-band" agreements.

The agreement with Japan illustrates how flexible voluntary controls can be. Almost nothing is known about this agreement, except that the Japanese indicated they wouldn't disrupt the U.S. market. According to one version, Japan agreed in early 1983 to reduce its shipments by 1 million tons.

That reduction did take place last year. The 4.1 million tons imported from Japan came to 5.1 pct of U.S. supply. Japan's numbers were almost identical with Europe's and it appeared the Japanese were following the Common Market formula.

In the first seven months of 1984, however, more than 3.8 million tons were imported from Japan. That came to 6.5 pct of U.S. supply and there were reports that still larger tonnages were on the way from Japan.

Considerably different is the agreement which limits imports from Europe to about 5 pct of U.S. supply. There are clear-cut limits on most products in this agreement and there is provision for regulating volume. A licensing procedure assures compliance with the specified limits.

The biggest problem with any negotiated scheme is that nearly half the imports are coming from smaller countries and there are a lot of these. Fifteen smaller nations shipped significant quantities of steel to the U.S. last year.

NONFERROUS

Political and business economists have been quick to hail the slowup in economic growth as a big plus, but nonferrous metals companies can't be blamed now for wondering if they have been shut out of the recovery altogether.

Primary and secondary metals prices softened steadily in the third quarter, shipments nosed down for seasonal and other reasons, import pressures continued unabated and the metals companies have not been doing anywhere near as well in the profits column as many of the key industries they supply—such as the automotive and appliance industries.

The automotive industry continues to be the main engine of the recovery, with car production through Labor Day running about 25 pct ahead of last year and truck output looking like a 40 pct gainer with an assist from the minivans. Detroit's metals consumption has been in high gear all year—the increase in car output alone was worth about 70,000 tons to the aluminum industry.

Weakness in free market aluminum ingot prices—with the spot prices on the London Metal Exchange down close to 50¢ a lb late in August—have been sapping strength from the aluminum industry's price structure, notably in the common alloy end of the mill products list. Suppliers have been resorting to pricing at time of order in some cases and increasing distributor discounts.

U.S. producers have trimmed production at domestic facilities (and are hoping their foreign competitors start doing the same) to dry up the surplus. At midyear, ingot production was up in all geographical sectors covered by the International Primary Aluminium Institute except Africa, where production was off about 10 pct because the Volta smelter in Ghana remained idle for lack of hydroelectric power. Free world producers' inventories were up nearly 11 pct at midyear, with the gain in mill products and scrap larger than the gain in primary ingot. North American producers accounted for most of the increases in both categories.

U.S. imports of aluminum mill products were up sharply in the first half. Imports of ingot and scrap also rose.

The copper producers continued to have their own problems with imports. Domestic producers hopes for assistance from Washington were crushed in mid-September when President Reagan rejected the industry's plea. Meanwhile, the U.S. mines were preparing further cutbacks of their own as inventories showed signs of moving upward toward the end of the first half.

Copper prices were weak through the summer season, which covers the vacation at many brass and wire mills. Domestic copper consumption remained strong. U.S. refineries managed a 6.4 pct gain in shipments during the first half (during which refined production was up only 1.2 pct but crude output was up 20 pct) without any advantage in the price department.

A missing ingredient in the copper equation, capital spending, was beginning to stir a bit at midyear, but so was the money market and the threat of rising interest rates began to cast its shadow over the metal markets generally.

Lagging capital equipment business also has impeded recovery in the nickel business again this year. Free market nickel prices trended downward in July and August while the producers strove to keep production in check and work inventories down further.

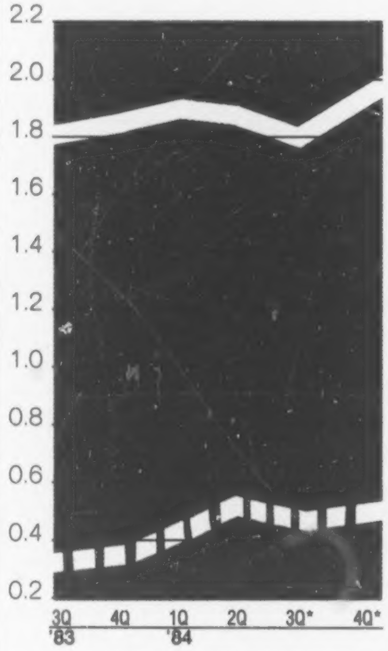
Lead got a lift during the first half from a 20 pct jump in shipments of automotive replacement batteries to 26 million units. The extra 1.5 million or so original equipment batteries which the auto industry needed for its increased production of cars and trucks through late August also helped.

Increased use of galvanized steel by Detroit also gave a boost to zinc. Shipments of zinc and zinc-based alloy castings were running about 20 pct ahead of the 1983 pace at midyear.

U.S. (aluminum) producers have trimmed production at domestic facilities . . . .

Nonferrous Metals Shipments

Millions of Short Tons



Source: American Bureau of Metal Statistics, Aluminum Assn.

*IA estimate

AUTOMOTIVE

U.S. automakers likely will sell 2 million cars in the fourth quarter. That's about how many they sold in this year's third quarter, but up by 11 pct over last year's fourth quarter.

The 2 million sales in the last quarter will bring auto sales for all of 1984 to 8.3 million domestic units, a jump of 1.5 million units from last year's 6.8 million sales. The voluntary restraint agreement (VRA) has kept import sales steady at 0.6 million units in every quarter of 1983 and 1984.

Production in both the third and fourth quarters this year should come in at just under the 2-million mark.

Dealers presently have almost a 50-day supply of cars. That is less than the 60-day supply they consider best.

By the end of the fourth quarter, dealer supply may rise somewhat: to a 55-day supply, estimated the analyst for one Big 3 automaker.

Consumer confidence in the economy is still high, though not as high as it was at the start of 1984. In January, consumer confidence was at 99.5, the highest in the last decade, said the University of Michigan's Institute for Social Research (Feb. 1966=100). The index dropped to 96.6 in the second quarter.

Automakers expect interest rates to remain at about 13.5 pct through the end of this year and the first half of next. They are forecasting a 13 pct rate in the second half of 1985.

"An increase in automotive interest rates," said one automaker's analyst, "is more of a psychological problem than a monthly monetary problem."

A rate increase of 2 pct, he said, "would increase monthly payments for an average $10,500 car by $7.

Automakers expect the U.S. government to allow more imports when the current VRA expires April 1, 1985.

"I expect the VRA to be continued," said one automotive analyst, "but altered to allow 10 pct more imports. If the government removes VRA completely, that will completely wipe out U.S. small-car production."

Chrysler recently extended its agreement to import Mitsubishi cars until 1995. The No. 3 automaker has negotiated with South Korea's Samsung Industrial Group to build Horizon-type subcompacts in Korea in the late 1980s. GM and Ford are pursuing similar deals in Korea, Japan and Mexico.

One market segment in which the U.S. has gained sales has been compact pickup trucks. Imports used to account for about 90 pct of those sales. But products like the Ford Ranger and Chevrolet S10 have enabled U.S. automakers to gain 50 pct of that market segment. Mini vans like Chrysler's Caravan and utility vehicles like AMC's Cherokee Jeep, Chevrolet's Blazer and Ford's Bronco II also have established American dominance in those markets.

U.S. automakers vigorously deny charges that the VRA is the big reason for their big profits.

"Most consumers are paying more for new cars than they did for the cars they trade in," said the chairman of one of the Big Four companies in a recent speech. "But most of the difference is a matter of deciding to buy a larger vehicle and equip it with more options.

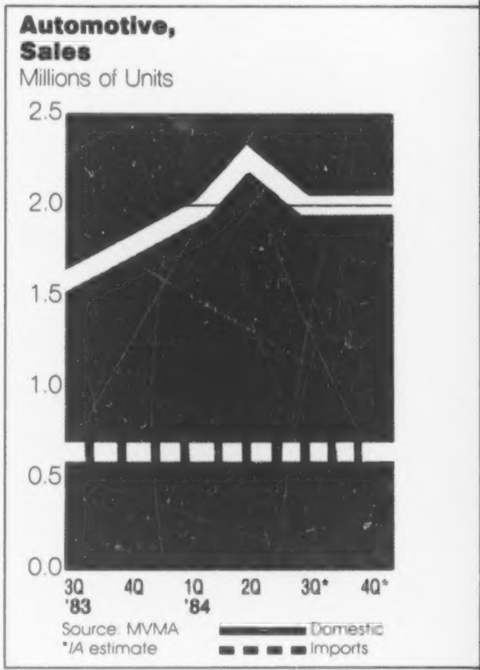
"Prices of U.S. small cars, most affected by the import restraints, have increased by just 2 pct a year—about half the rate of inflation."

For the 1985 models, automakers cut or froze prices on the small cars but raised them for bigger ones. Price increases of the Big Four averaged about 2 pct, or $225 per car.

The automakers' current profits are large, but so were their earlier losses.

"Total losses and investments for the Big Four companies during 1980-83," noted one automotive chairman, "came to $42 billion. We earned $6.5 billion in the first half of 1984. We're still about $35.5 billion shy of getting back to the starting gate."

The last quarter will bring auto sales for all of 1984 to 8.3 million domestic units.



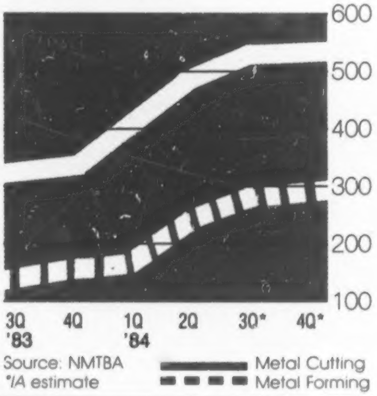
Automotive, Sales
Millions of Units

Source: MVMA
*IA estimate

MACHINE TOOLS; FLUID POWER

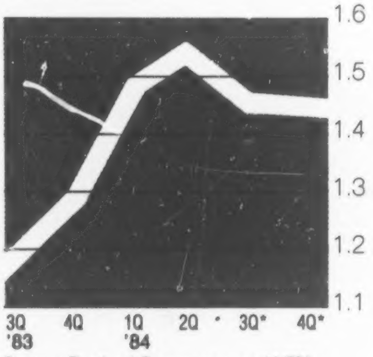
(Machine tool) order books are better than they have been in recent years.

Machine Tools, Net New Orders
Millions of Dollars



Source: NMTBA
*IA estimate

Fluid Power, Shipments
Billions of Dollars



Source: Dept. of Commerce and NFPA
*IA estimate

MACHINE TOOLS—The long-awaited capital goods recovery simply hasn't arrived for machine tool builders.

Orders are up. "But, up from the worst recession anyone can remember," notes one builder.

Coupled with the dismal past two years is the performance of the Asian builders, particularly Japan.

Imports now have almost 40 pct of the U.S. market and, unless President Reagan gives domestic builders the protection they seek, that figure seems sure to rise.

Sources in Washington vary in their predictions about import quotas. Some still expect a White House nod on the industry's petition which would give U.S. builders a five-year, 85 pct share of the domestic market. Others expect half-a-loaf, with only selected types of machine tools given protection.

Meanwhile, the order books are better than they have been in recent years. "That's some consolation," said one builder. The rest of 1984? "More of the same. I mean a slow return. A slow recovery for us," he added.

But, even with a steady return to normal business in the industry, there is another cloud on the machine tool horizon and it could exacerbate the import problem—capacity, or more correctly, under-capacity. If the industry's fortunes improve steadily, as they have been for many months now, then, without any increase in capacity, lead times will surely lengthen. It was largely long lead times that opened the door to Japan in the first place during the auto-pushed boom in tools a few years ago.

Meanwhile, many in the machine tool industry expect their recovery to be slow, but steady.

Companies in general expect the rest of 1984 to be characterized by steady but slow growth with domestic sales levels by mid-1985 at or perhaps even exceeding the near-$6 billion level of the recent past. The big question is how that hoped-for sales level will divide.

FLUID POWER—A slight summer cold seems to have hit the fluid power industry, and it could hang on through the fourth quarter.

That's not enough to stall the good recovery fluid power has scored in 1984. There's still reason to believe that fluid power equipment builders, both hydraulic and pneumatic, will score their best year in dollar volume since 1981.

Much of the caution about the coming months stems for the unexpected pattern the industry orders followed over the summer. On the basis of surveys from the National Fluid Power Association, orders didn't show quite the June strength that many in the industry had anticipated.

July didn't show as much of a seasonal drop in shipments as usual. But August, which seasonally snaps back upward from the July low, doesn't seem to be jumping as much as it should.

That concern over the fourth quarter isn't clearly spelled out in a good-sized sample of orders yet. Any feeling that the steam has gone out of the industry's recovery is based more on lead indicators or subjective opinions, than an actual change in the order rate.

Much of the concern is pegged to the heavy mobile equipment markets, which have grown more cautious about their own fourth quarter outlook.

That coupled with a little less demand from machine tool builders and concern over the effect of an auto strike on light hydraulic systems has produced some downward revisions in fourth quarter forecasts.

This isn't unexpected. Only in the early stages of a strong recovery is the industry's fourth quarter volume apt to exceed its third quarter, even allowing for the usual July slowdown.

Export is doing little to help offset the domestic market slip. It's still plagued by the strong U.S. dollar, which is throwing some business into overseas plants.

INDUSTRIAL COATINGS; PLASTICS

INDUSTRIAL COATINGS—Makers of industrial coatings expect to ship about 100 million gallons of their products in the fourth quarter. That's an 11 pct increase over the estimated 90 million gallons shipped in the third quarter; and a whopping 22 pct increase over the 82 million gallons shipped in the fourth quarter of 1983.

The rebound in auto sales has meant big increases in coating shipments to the carmakers—up by 25 pct over last year, according to a vice president of one leading Midwestern company. "So have sales to makers of metal decorating material and business-machine housings," he commented.

Shipments of coatings to furniture companies, noted another VP, have risen this year but will slow in the fourth quarter. He expects such shipments to revive in the first quarter of 1985.

Shipments of coil coatings for residential use have been dropping and will continue to drop, said one industry vice president.

"For all types of coatings," reported the executive, "the market in wall coatings and panels has been static."

Makers of appliances are pretty much committed to using pre-painted steel coil. But so far, they haven't bought a lot of the coil.

"Appliance makers," said one coating executive, "will continue to order big quantities of other types of coatings besides coil in the fourth quarter, as they've done all year. They still haven't made the expected shift to coil."

Third quarter shipments of coil coatings to the appliance industry were slow," he maintained.

To meet U.S. Environmental Protection Agency requirements, the entire coatings industry is using more solids in its products, which means lower weights.

Because of this switch to higher solid coatings, said one executive, "you will begin to see a decrease in the number of gallons shipped by the industry."

PLASTICS—The plastics industry just seems to keep humming right along.

The second quarter came through as expected, and the third quarter experienced a minor seasonal drop of no more than 0.3 pct. The fourth quarter will be expected to regain the strength of the second quarter, and then some.

No matter how you look at it, 1984 shows all the promise of another record year for the plastics industry.

Leading the way among the thermoplastics are nylon, ABS and the vinyl resins. Over in the thermosetting camp, the epoxies and the unsaturated polyester resins are demonstrating unusual strength.

In terms of sales and captive use, plastics are up over last year by 7.3 pct for the first six months. The big gain has been in the thermosets, with an 11.3 pct increase. Though not as impressive, the thermoplastics did show a good gain of 6.7 pct. (Typically, thermoplastic consumption runs about 7 to 8 times that of the consumption of thermosetting resins.)

The plastics industry was riding high during the first quarter of 1981, but went into a tailspin that lasted for about two years. Last year was admittedly a spectacular year, and the pundits are looking for 1984 to be the best one yet.

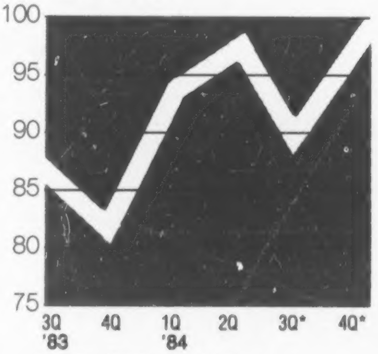
On the production side, styrene acrylonitrile (SAN) resins are up 136 pct, while nylon resins are up by 54.8 pct. Both of these materials, however, take up a small percentage of total plastic usage and production. A strong material, in terms of volume and in terms of increases in production and in sales and captive use, is polyvinyl chloride.

Through April, polyvinyl chloride had shown a 22.7 pct increase in production and a 17.8 pct increase in sales and captive use over the same period last year. In sales and captive use, its volume was 2.4 billion pounds.

There is no doubt that plastics will continue to be a bright spot on the industrial horizon throughout the year.

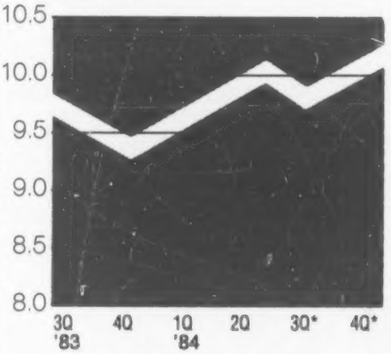
The rebound in auto sales has meant big increases in coating shipments.

Industrial Coatings, Shipments
Millions of Gallons



Source: Dept. of Commerce
*IA estimate

Plastic Resins, Sales & Captive Use
Billions of Lbs



Source: SPI Committee on Resin Statistics, compiled by Ernst & Whinney
*IA estimate

COMPUTERS; INSTRUMENTS & CONTROLS

COMPUTERS—A healthy U.S. economy means a healthy computer business. Shaking off an uncharacteristically slow year (for the computer industry) in 1983, where business only improved 15 pct, the industry should see a pickup of 22 pct by the end of 1984.

In the early months of 1984, a spurt in computer and computer-related equipment sales took place. The jump in sales resulted from an improved economy which has permitted business to send more money to assuage its pent up demand for computers.

In addition, computer products have been more readily available this year than last. The gradual improvement of the European economies has also contributed to improved sales.

The computer industry got off to a fast start this year; sales have held up through the third quarter. A slight slowdown is likely in the fourth quarter due to a tightening of the economy and some price cutting. The specter of rising interest rates could also hurt sales over the next few months.

However, the biggest concern of the industry remains the growing trade deficit of computer products. Computer imports, especially from Japan, continue to outdistance U.S. exports.

Personal computer sales continue to soar. As the economy improves and companies become increasingly profitable, more and more firms are turning to PCs to meet business needs. Not only are these computers filling front offices but they are also beginning to move in greater numbers into the factory. Increasingly, PCs are being used to program, analyze, and even run machinery. PC software that addresses factory floor needs is also selling well.

Mainframe computers have experienced major sales increases through the first nine months of 1984 as have the superminicomputers, especially those linked to computer-aided design/computer-aided manufacturing (CAD/CAM) operations.

INSTRUMENTS & CONTROLS—Sales in instruments and controls have been a surprise. Through the end of the third quarter, sales are up about 10 pct over a year ago.

The year started off strong, with shipments up about 14 pct over 1983 figures. In the third quarter, these shipment gains slowed, but remain higher than forecast. The fourth quarter should see further slippage.

From an industry that expected little growth this year, these increases have come as a welcome surprise. The continuing rebound of the U.S. economy is the main reason. In particular, instrument sales to the appliance and the automotive industry have been strong.

Instruments aimed at the computer, semiconductor, telecommunications, and computer peripheral market continue to be purchased in large numbers. Sales through September are running 20 pct above totals of a year ago.

In the past, a large portion of instruments and controls were exported. With the recession in Europe and the third world countries, export sales have fallen off in recent years. In the last several months, overseas orders, especially from Europe, have picked up and should continue to rise through the remainder of this year. Increases should not be too dramatic, however, because of the continuing strength of the dollar against other currencies.

Besides the expensive dollar, increased foreign competition is making overseas markets harder to penetrate. The competition, chiefly Japan, is also stepping its exports to the U.S.

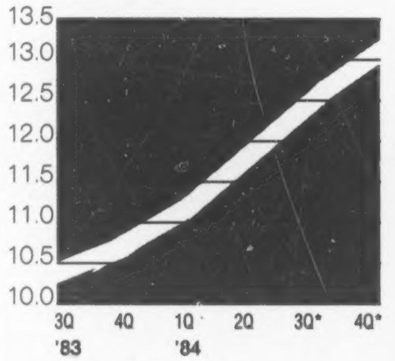
Next year should be an even better year for the industry. According to the Conference Board, the nation's 1,000 largest U.S. manufacturers set a new record for capital appropriations in the second quarter of 1984.

Instrument shipments are closely tied to capital spending, so big capital budgets for 1985 are good news for the instruments and controls makers.

The computer industry should see a pickup of 22 pct by the end of 1984.

Computers, Shipments

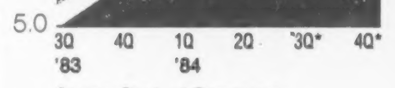
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Instruments & Controls Shipments

Billions of Dollars

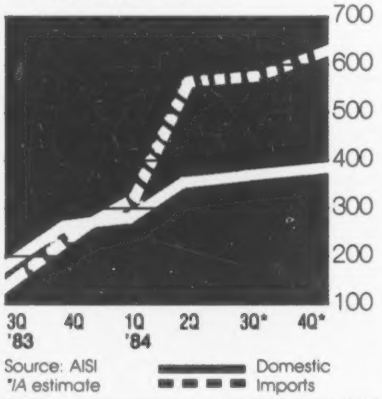


Source: Dept. of Commerce
*IA estimate

OIL COUNTRY; MINING EQUIPMENT

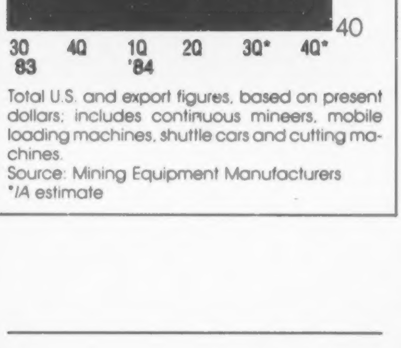
The excess inventories of pipe and tube have begun to evaporate.

Tubular Goods, Shipments
Thousands of Net Tons



Source: AISI
*IA estimate

Mining Equipment, Sales
Millions of Dollars



Total U.S. and export figures, based on present dollars; includes continuous mineers, mobile loading machines, shuttle cars and cutting machines.
Source: Mining Equipment Manufacturers
*IA estimate

OIL COUNTRY—A strong increase in shipments of oil country tubular goods appears likely to continue through the remainder of 1984. Most industry indicators remain strong, and many foresee a growth trend continuing into 1985.

The market is being aided by a number of factors. The rig count utilization rate has climbed steadily since April, and has increased some 12 pct over the comparable period of last year. Crude oil prices have remained stable; most observers foresee that trend continuing through at least the end of 1984. The total footage of oil and gas wells drilled in the U.S. is up nearly 14 pct from last year. Most importantly, the excess inventories of pipe and tube have begun to evaporate, allowing drilling companies and other consumers to buy new product at a level more in line with the pace of activity.

Despite the generally positive trends, there are still some potentially adverse elements that could impact the industry. While OCTG shipments may nearly double from their 1983 levels by the end of this year, they are far below the peak years when domestic mill shipments averaged 2.5 million tons annually. The most positive predictions for 1984 foresee 1.2 million to 1.3 million tons shipped from domestic mills.

Foreign mills have dominated the market for most of the year, and shipments of imports have been outpacing increases in domestic production.

Also, recent pipe and tube consumption has been greater in the carbon grades than the more expensive alloy grades. Suppliers would like to reverse that trend, but recent drilling has been concentrated in shallow wells that can utilize the cheaper product.

Despite these trends, most industry executives remain optimistic. It appears all but certain 1984 will wind up a more profitable year than 1983. Increased drilling activity in the Gulf Coast and new exploration off California are further reasons for optimism.

MINING EQUIPMENT—Mining equipment in some areas, seems to be an industry that has contracted for the duration. This is particularly true in iron ore.

Not only has the steel slump severely damaged iron ore companies, but the threat of a worldwide glut in iron ore looms large over the Great Lakes. In iron ore, the business for equipment makers has been largely maintenance and replacement for the past few years. No new mines in North America are planned and many have closed or are on severely reduced schedules.

If the threat materializes, the once booming upper Great Lakes mining area might revert to forest again, some pessimists predict.

Others are less gloomy about domestic and Canadian iron ore and note that transportation costs as well as the "security" of domestic supply will keep Minnesota, Michigan and Canadian ore preferable for U.S. mills.

Coal mining, on the other hand, remains relatively healthy although that health could turn sickly if the industry fails to reach a new agreement with the United Mine Workers. The contract was scheduled to expire Sept. 30.

Presently, industry observers don't expect a work stoppage and the industry in general is in good shape. Mining equipment manufacturers report business is good and getting better.

Still, the U.S. mines about 830 million tons a year and few expect that number to decline significantly in coming years. Some in the industry expect it to rise significantly in about three years due to various cleaning technologies and the demise of nuclear power.

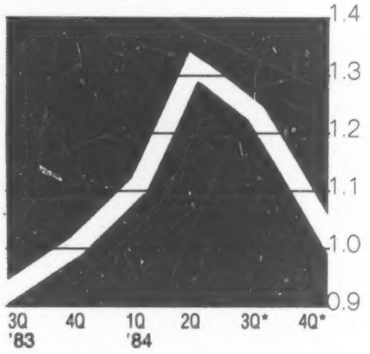
Coal mining equipment companies expect the industry to remain relatively healthy through the foreseeable future.

While the iron ore business is showing negative equipment growth, coal suppliers expect the third quarter of 1984 to be up slightly over the second, but the year to show a gain over 1983 of as much as 12 pct in sales.

CONSTRUCTION; FARM EQUIPMENT

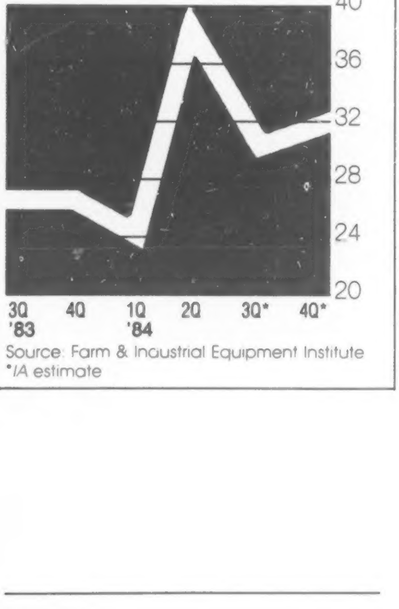
(Construction) machinery builders are cautious about the second half. . . .

Construction Equipment, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Farm Equipment, Wheeled Tractor Sales
Thousands of Units



Source: Farm & Industrial Equipment Institute
*IA estimate

CONSTRUCTION—Despite the sharp gains in construction machinery sales during the first quarter of 1984, machinery builders are cautious about the second half and the first half of 1985.

Distributors about doubled their original forecast for the first half of 1984 and the Associated Equipment Distributors reports that based on a survey of 200 dealers, 1984 sales will be 20 pct over last year.

One problem in the construction machinery market in the past three years has been an oversupply of machinery in dealerships. That situation was correcting itself during 1983, but only at the cost of some sharp cuts in equipment prices. The "fire sales" of 1982 continued into 1983, and the scars were still visible during 1984.

For instance, Caterpillar Tractor reported $3.2 billion sales in the first half of 1984. That's up 58 pct, but it's almost 16 pct under sales in the same period 1982, when construction machinery was in one of its worst declines.

Typically, the heavy industries show a fairly long lag time between the beginnings of an order increase and a gain in actual shipments.

The caution in the outlook, despite the backlog gains, has a lot to do with the continuing strength of the dollar.

The Construction Industry Manufacturers Association reported a 22 pct gain in first quarter exports, but that is still 40 pct below the year-ago numbers. The gains in export began in 1983 and apparently have continued, but from a low base. Export is important to U.S. machinery builders, and some builders historically have made half their sales in export markets.

The *Iron Age* forecast, because of the rising order backlog, may be overly conservative for the second half. Some manufacturers believe the fourth quarter could be their best 1984 quarter, as happened in 1983. Particularly in view of the sales gains at the dealer level in first half.

FARM EQUIPMENT—From Russia with Love? That 11 million ton grain export order from the U.S.S.R. has put some bloom back in the cheeks of U.S. farm forecasters who've been agonizing over falling commodity prices and drought. Usually, a cut in the harvest brings up grain prices, but it hasn't happened.

Will an export order equal to 10 pct of U.S. annual feed grain production pull up agricultural markets? It can't hurt, one veteran analyst said, but didn't feel it was going to help much either. At least, he added, "It's a good sign, but there aren't enough of those good signs yet to be very definitive."

Two major equipment producers have said they will curtail production at some plants during the fourth quarter. Others have been less outspoken, but have privately indicated they were holding at relatively low production schedules despite the on-again, off-again sales fluctuations of the first half.

July tractor shipments dropped again, and somewhat more than seasonally. Combines, the other big-ticket item on the farm machine selling list, have been more of a problem. Shipments of combines were off 25.6 pct in the first six months of this year, according to the Farm & Industrial Equipment Institute. More troubling, the pull-behind implements that were the first to recover in 1983 are also off through the first half of 1984.

So with due appreciation for the new export orders, there's little joy in farm machine circles.

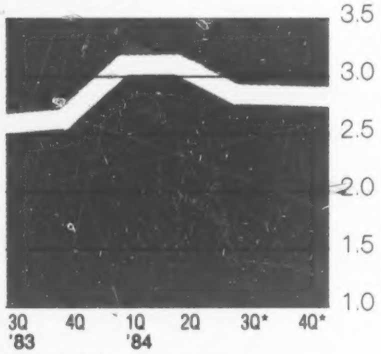
The export sales could feed more dollars back into the farm market later this year, but that would largely help the 1985 equipment market.

The third calendar quarter of any year sees a seasonal drop in farm machine shipments, followed by some gains in fourth quarter. But the fourth quarter gains are closely tied to taxbuys by farmers in December. The October-November selling period can be slow and probably will be in 1984.

CASTINGS; FORGINGS

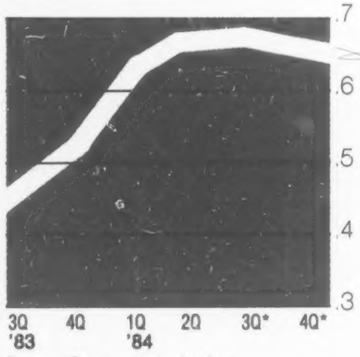
A number of (foundries) say they'll finish this year 20 pct above 1983.

Ferrous Castings, Shipments
Millions of Tons



Source: Dept. of Commerce
*IA estimate

Impression Die Forgings, Shipments
Billions of Dollars



Source: Forging Industry Assn.
*IA estimate

CASTINGS—The copper and brass foundries seem to have held up better in the third quarter than the ferrous foundries and aluminum castings producers.

In aluminum and iron-based castings there's been a little more summer hesitation than can be accounted for by the normal seasonal slump in July, when the bulk of U.S. foundries take their plant vacations.

Some foundries point to a buildup in castings inventories during May and June. This was bigger than the usual inventory increase by customers who are offsetting foundry vacation shutdowns by adding to their inventories.

This still leaves 1984 as a substantially better year than 1983, which itself was over the low castings total for 1982. Even with the downward revisions in the forecast that were made in July, a number of sources say they'll finish this year 20 pct above 1983. That's well in line with the *Iron Age* outlook for third and fourth quarter foundry operations.

A conservative forecast would put third quarter shipments at about 25 pct under the second quarter peak. And fourth quarter would run at about the third quarter shipment levels.

This would allow for a drop in November followed by an upswing in December that should keep the fourth quarter total close to 3 million tons of castings shipments.

It's notable that aluminum, which did better than ferrous castings in 1983, is tending to follow the ferrous castings forecast for the fourth quarter.

This still leaves the problem of the possible auto strike. A long strike could knock out some big captive foundries and pull down second half totals. And it could affect some copper business.

With the continuing strength of auto sales in recent weeks, that could produce a sharp slump and push a lot of make-up business later into the fourth quarter after the auto plants return to business.

FORGINGS—The forging industry continues its slow but steady pace upward.

The third quarter began on an off-note, with July orders for impression die forgings down 26 pct from June bookings. July declines were expected due to traditional plant vacation shutdowns.

More importantly, July totals were a 30 pct increase over 1983 figures. On a year-to-date basis, order bookings through July were up 39 pct compared to 1983.

Preliminary August and September orders are show marked improvement over July. And the fourth quarter should see the gradual growth of the first three quarters continuing.

The industry's rebound remains less than spectacular because of the slower pace in three key markets—aerospace, farm and construction equipment, and oil field goods.

Despite healthy injections of defense spending this year, the aerospace industry continues to be weighted down by the commercial sector. Commercial aircraft deliveries this year will amount to less than half the number delivered in 1980 and 1981.

On the brighter side, orders for commercial airplanes have been on the increase since the second half of 1983. More orders should be forthcoming next year largely because the U.S. commercial airline fleet is aging.

The farm equipment market is not expected to show much strength this year. Farmers are reported to be in bad financial shape and few machinery orders are expected. And the oil field market is still below the peaks hit in the early 1980s, although some forging companies have noted some isolated sparks of life.

The automotive industry continues to churn out cars and demand impression die forgings. Healthy truck and car sales are a chief reason for the growth that the forging industry has achieved this year.

APPLIANCES; MATERIAL HANDLING

APPLIANCES—The appliance industry, a strong performer last year, is topping those efforts this year. Well into the third quarter, total major appliance units shipped are running some 30 pct above the 1983 pace.

The industry has been holding up much better than expected. Earlier this year experts were predicting less than a 6 pct improvement this year compared to 1983. That figure was then raised to 10 pct, then 15 pct—and unless the industry really flattens out in the last quarter, a 20 pct growth figure is not unrealistic.

"If shipments for the remaining months continue at a level comparable to last year's, the 1973 record of 35.8 million units will be shattered," said one industry executive.

In early summer, appliance sales were led by room air conditioners, dehumidifiers and microwave ovens. But as the summer progressed, declines in air conditioner and dehumidifier sales were more than offset by major pickups in all types of appliances with the exception of refrigerators, whose sales dipped slightly.

Despite a fast finish for the appliance industry in 1983, this year's sales figures should continue to hold up for several reasons. For one thing, despite recent drops in housing starts, the builder demand for appliances should remain strong through 1984. Though housing starts may be dropping, housing completions remain high.

For another, consumer spending continues apace despite slowly rising interest rates. Many major appliances, bought around the record appliance-purchasing year of 1973, are due for replacement. Consumers, with some extra cash in their pockets, are doing just that.

The major dark cloud over the industry is the threat of rising interest rates, which could curtail credit, reduce housing starts and sales, and slow consumer spending.

MATERIAL HANDLING—Material handling equipment manufacturers are reporting a mixture of good news, bad news and old news.

The good news is that much of the industry, including even industrial truck makers, is recovering.

The bad news is profit margins remain, as they typically have been, rather low in material handling. "This is particularly true when your talking about engineered product," explains one systems maker.

The old news is more good news so far. Material handling, except for trucks, is one U.S. industry that isn't being decimated by foreign producers.

The third quarter of this year is turning out to be a significant, if not terrific improvement over the second quarter and a remarkable improvement over the third quarter of 1983. The rest of the year "looks very good," says one industry analyst.

Others note that the recovery in general, or more particularly its length, is the best news the industry has had in years. "Slow, steady growth is what we feed on. Our customers buy these systems only when they perceive a time period that will allow the return. That time period is a matter of several years," says one company chairman.

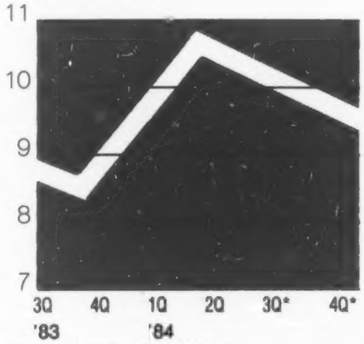
According to the industry, the business world is coming to believe that this recovery is long-lasting enough to consider investing in Automatic Storage and Retrieval (AS/R) systems in a big way. Thus the great expectations of the material handling industry for the rest of this year and especially for 1985. Next year may be a $6 billion year for the industry. And, the last quarter of 1984 is almost definitely going to top the $1 billion level.

"What we make," says one top executive in the industry, "is a necessity for the rest of the industry. But, it only sells when the rest of business sees extended prosperity. We believe they're seeing it now."

Total major appliance units shipped are running some 30 pct above the 1983 pace.

Appliances, Shipments

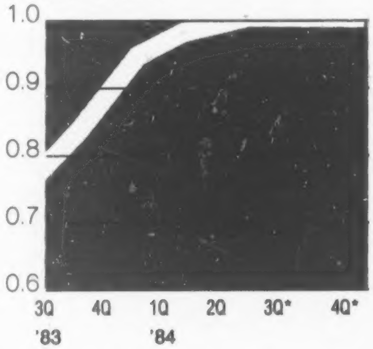
Millions of Units



Source: Association of Home Appliance Manufacturers
*IA estimate

Materials Handling, Shipments

Billions of Dollars



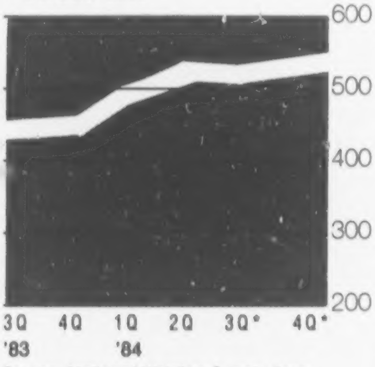
Source: Material Handling Institute
*IA estimate

WELDING; HEAT TREATING

One observer of the welding industry . . . sees a strong finish to the year.

Welding, Shipments

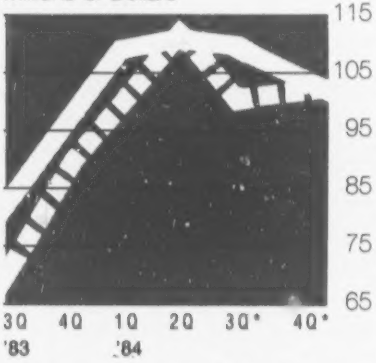
Index: 100 = $200 million in distributor sales



Source: National Welding Supply Assn.
*IA estimate

Heat Treatment

Millions of Dollars



Source: Industrial Heating Equipment Assn., Metal Treating Institute
*IA estimate

▬ Sales of Commercial Heat Treaters
▬ ▬ ▬ Heat Processing Equipment Orders

WELDING—The second quarter of 1984 was the best quarter ever in terms of distributor sales, according to the National Welding Supply Association (NWSA). To some, this could be misleading because the domestic manufacturers of welding equipment and consumables have been hurting.

The explanation is obvious. There are many more foreign producers vying for the U.S. welding market.

According to the NWSA statistics, this year's second quarter was 21.3 pct better than the same period last year and about 30 pct ahead of 1982.

Although no record-breaker, the third quarter was not bad.

One observer of the welding industry said that the industry "is stopping to catch its breath after its big surge in May." He looks for the vigor to reassert itself during the third quarter and sees a strong finish to the year.

The aforementioned "big surge in May" was a welding supply index figure of 181.6. All told, the NWSA index figures are running well ahead of any other year. Both equipment and consumables are also well ahead of 1983.

A distributor in the Southwest said: "We had the best July in the 35-year history of our company."

Another distributor executive in the East observed a willingness to spend money for capital equipment and a pick-up in customer orders to meet increased demand.

"We are finding extremely competitive conditions in the industry and more acceleration than in three years," he said. "However, sales are at a pace we can live with."

One very bright market for welding is in the nuclear business. This is quite contrary to what one might expect, but the strength of nuclear is in weld repair. Navy shipbuilding is another plus.

Throughout industry in general, there has been a noticeable increase in gas-shielded and self-shielded semiautomatic welding.

HEAT TREATING—Heat treating is holding with real strength. Several heat treating plants saw no seasonal slowdown in July—though most usually do—and continued through August at about the clip they enjoyed during July.

Some shops are reporting a backlog decline since July. And it appears that the jam-up in heat treating deliveries in May and June had begun to sort itself out by the end of June. Deliveries were getting more predictable during July, even during the plant vacation period.

So it may be that the fourth quarter forecast for heat treating, based on data collected by the Metal Treating Institute, is on the low side. It suggests a decline in the fourth quarter by about 4 pct. In 1983, the fourth quarter was 11 pct over the third quarter.

The totals reported by heat treaters through June and July are impressive. Although 1982 and 1983 were bad years, by comparison with past highs, it's not uncommon to find heat treaters who had a cumulative new order total through July that was 60 pct or even 70 pct over the year ago period.

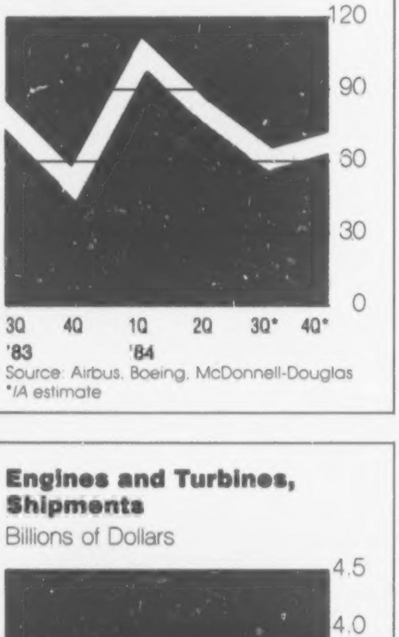
The first quarter results obtained by the MTI from its members are a wider sample, but even this was up more than 36 pct over the 1983 period. The second quarter of 1984 was at least 20 pct over the year ago period. Heat treating equipment sales, on the basis of data reported by Industrial Heating Equipment Association, scored an even higher year-to-year gain in first half.

Any real softening in heat treat and heat treat equipment markets is still to come. A possible auto strike and cutbacks by some heavy equipment industries are bound to have an effect. Interestingly, one source notes that precision gear heat treat work is still rising, after failing to get started until as late as the June-July 1984 period.

Still, heat treating equipment orders should rise in the fourth quarter, after the hot business levels in many heat treating shops during the summer.

AIRCRAFT; ENGINES & TURBINES

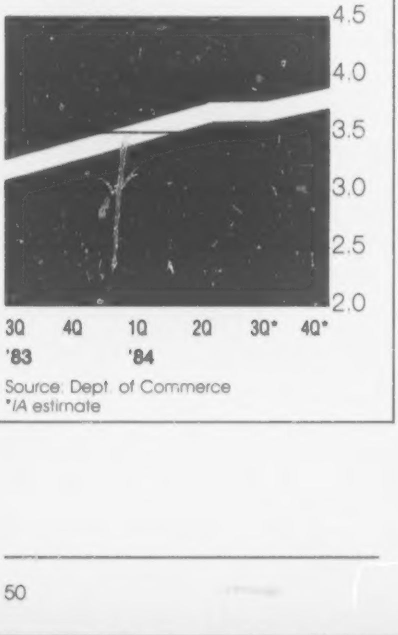
(Aircraft) orders for 1984 have surpassed the depressed level of 1983.



Commercial Airplane, Orders

No. of Planes

Source: Airbus, Boeing, McDonnell-Douglas
*IA estimate



Engines and Turbines, Shipments

Billions of Dollars

Source: Dept. of Commerce
*IA estimate

AIRCRAFT—The major airframe manufacturers continue their slow but steady climb out of the recession that has plagued the industry for more than two years. Orders for new aircraft were dramatically higher during the first half of 1984 than they were a year ago. Most industry officials are looking for this order surge to abate in the third and fourth quarters. Even so, new orders for 1984 have surpassed the severely depressed level of 1983.

Restored profitability for airline companies operating both in the United States and overseas is being cited as the single most important factor working to bolster the industry. Lower fuel prices also are helping the airline firms climb out of the recessionary spiral and update their fleets with new orders for more fuel-efficient aircraft.

Nevertheless, despite projected growth in passenger traffic for the third and fourth quarter, airframe industry officials remain cautious.

There continues to be excess capacity, especially in the wide-body jetliner portion of the market. Airframe manufacturers also face substantial price pressures, which are resulting in unique financing arrangements and the trade-in of older airplanes.

For example, Seattle-based Boeing Commercial Aircraft Co. announced in mid-August that Saudia, the national airline of Saudi Arabia, had ordered 10 747-300 airliners, a deal valued at about $1 billion. But Boeing agreed to be paid for the aircraft in a quantity of oil equal in value—at the official Saudia government price—to the purchase price of the airplanes.

Such barter arrangements are relatively unique to the industry. But they underscore the lengths to which airframe manufacturers must go to successfully conclude sales of new craft. Although the market has been improving for more than a year, it is likely such pressures will remain a reality through the remainder of 1984.

ENGINES—Shipments in this wide-ranging market have held steady or slightly improved during the past few quarters, a trend that should continue into the third quarter and through the remainder of the year.

Some improvement has been noticed in selected segments of the industry. Diesel engine makers report slightly increased activity in engine sales as a result of leveling interest rates and an improving stock market. But the long-term confidence level remains uncertain. Many customers are holding back until they are convinced the generally positive economic trends will hold up through the fourth quarter and after the upcoming national elections.

The oil segment of the industry remains sluggish. The hydropower end of the market is being affected by imports. Construction equipment has shown some improvement, but the uncertainty surrounding future interest rates makes any prediction of a substantial recovery in that segment dubious.

As for giant turbine generator sets, these continue to suffer as utility companies scale back earlier plans for expansion. The continuing controversy over nuclear energy—and the well-publicized problems facing several nuclear plants that have either recently opened or are soon scheduled to do so—have served to further drag down this market.

Many industry officials and analysts expect a rebound of sorts to take hold. But it is unlikely to occur in the second half of 1984. A move to substantial orders for new engines and turbines probably would not be felt until some time in 1985. Short-term predictions continue to remain cautious, as they have through most of the year.

The well-publicized general economic recovery will have to be sustained for a long period before the results translate into new orders for expensive, long-term products like large diesel engines and power plants.

SCREW MACHINE PRODUCTS; FASTENERS

SCREW MACHINE PRODUCTS—The screw machine products industry, which has seen significant growth through the first six months of 1984, slowed its expansion in the third quarter and may see a slight dip in orders in the fourth quarter. Even so, the industry should be up 25 pct and possibly 30 pct over 1983 by year end.

To a large extent the varied fortunes of screw machine product makers reflect the condition of U.S. industry as a whole. Screw machine product manufacturers who supply products to the high-flying automotive or appliance industries have done well, while producers serving the depressed farm equipment manufacturers or commercial aircraft companies have done poorly.

However, since more than 40 pct of screw machine product sales go to household appliance manufacturers (7 pct) and automakers (34 pct), the industry has experienced, for the most part, a good year.

The sales of screw machine products began leveling out in the third quarter and should see a slight drop in the fourth quarter, primarily because industries served by screw machine products industry are predicting similar growth curves. The automotive industry, while remaining healthy, is slowing its growth. Fourth quarter car production is expected to match third quarter totals, although by year's end, sales should be 23 pct above a year ago.

"Generally speaking, all our consumer industries are doing quite well except for aerospace and farm and construction equipment sectors," said an industry spokesman.

As for 1985, at least for the first six months, industry members see operations continuing on the same plateau that reached in the third and fourth quarter of 1984.

So while next year will probably see few dramatic upswings, business should, as one industry source said, "be very good to live with."

FASTENERS—Mechanical fastener manufacturers are reporting continued increases in business almost across their market board. Unfortunately, imports are picking up an ever-increasing share of those increases, industry observers report.

Overseas supplies of nuts and bolts in the "standards" end of the U.S. market are becoming so powerful that some in the American industry are predicting a consolidation of the remaining domestic makers in the "specials" end of the business. In effect, the U.S. mechanical fastener industry may be soon in complete forced retreat from the standard fastener market in its own country.

"We cannot compete on price with Japan and numerous other countries. It's impossible," says one company president.

Adds another, "There is no part of American industry anymore that says buy American when it comes to our product. It's strictly price."

So while the recovery may indeed be lifting all boats, it's lifting the foreign fleet to the disadvantage of U.S. fastener makers. "The recovery means there's a big increase in demand for fasteners. Unfortunately, people are opting for cheap stuff from overseas. It's that simple," says an industry expert.

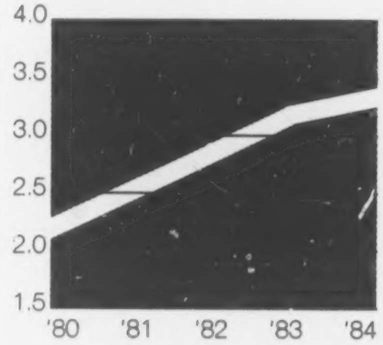
Yet, all is not bleak in the industry. Those companies that have already largely left the "standards" end of the business and are in "specials" or engineered fasteners are reporting a real recovery of their own with sales levels 10 to 20 pct above last year.

While their is still some hope that Washington will act to save the besieged U.S. "standards" industry, that hope is fast fading. A bill on downstream dumping recently passed the House. The Senate's action on this same bill would shore up the U.S. fastener industry, or what remains of it.

Meanwhile it's becoming a consensus in the remaining companies: get into specials or get out.

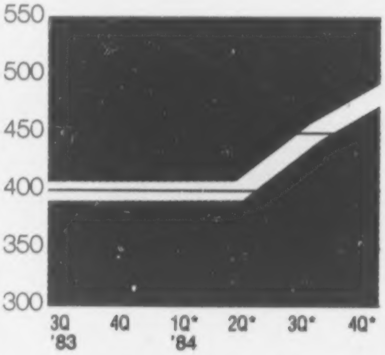
Sales of screw machine products should see a slight drop in the fourth quarter.

Screw Machine Products, Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Fasteners, Sales
Millions of Dollars

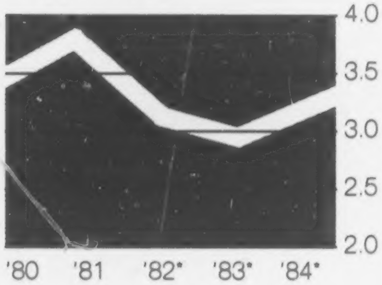


Source: SPI Committee on Resin
*IA estimate

BEARINGS; STAMPINGS

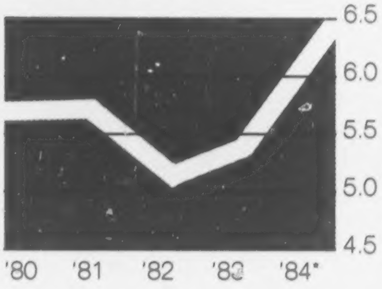
(The bearings) industry's sales could grow 14 pct by year end.

Ball and Roller Bearings Shipments
Billions of Dollars



Source: Dept. of Commerce
*IA estimate

Stampings, Shipments
Millions of Dollars



Based on the average of a control group whose shipments total more than $500 million annually.
Source: American Metal Stamping Assn.
*IA estimate

BEARINGS—The anti-friction bearing industry continues to bound up and down, although for the first three quarters of 1984 the ups predominated.

Industry sales could grow 14 pct by year end. This figure is several points higher than predicted earlier in the year because of the unexpected continuing strength of auto and truck sales.

Business should ease a bit in the fourth quarter as the automobile industry, the biggest purchaser of bearings, finds its growth curve leveling. Car sales in the fourth quarter should be no higher than the third.

Since the automotive industry accounts for approximately one-third of bearing manufacturer's sales, the nearly 25 pct growth of the auto industry in 1984 has pulled up many bearing producers. However, a number of industries continue to weigh the industry down. Sales to farm equipment and commercial aircraft manufacturers remains in the doldrums. Sales to construction equipment companies, railroad equipment makers, the oil field market, and to makers of industrial machinery has not been much better.

While bearing sales are improved over last year, the industry has too many millstones around its neck to have a banner 1984. Any slowdown in auto output could hurt the industry.

Expenditures for capital equipment have risen about 13 pct this year. However, since capital spending was cut back so severely during the past recession, the growth (as a pct of GNP) now taking place continues below pre-recession levels. Limited spending on new machinery means that manufacturers are still maintaining old equipment, equipment in need of bearings.

The bearing replacement market, up from the first half of the year, should remain strong through the fourth quarter. With the expected pickup in capital equipment purchases next year, the replacement market should gradually weaken in 1985.

STAMPINGS—The economic recovery may be slowing, but it doesn't seem to be choking stamping industry confidence about the near future.

Industry executives look forward to a prosperous last quarter of 1984 and a healthy 1985.

Much of their optimism is based on ongoing consumer spending spree, particularly in new car sales.

Effects of a GM strike? "It could dent the GNP slightly," said one Midwestern stamper, "and maybe weaken the dollar and even lower interest rates a bit if it would go on too long. I don't believe it will. I don't think it will have much impact at all."

Figures from the American Metal Stamping Assn. buttress individual stamper's confidence.

July stamping shipments did fall prey to the usual summer slump, but order bookings for the month were 5 pct ahead of June's level and 30 pct ahead of July 1983. This put July 1984 year-to-date orders 27 pct over those of the same period in 1983.

The AMSA report also indicated that stamping industry backlog remained strong in July, reflecting shorter lead-time periods.

Despite some consumer buying slowdowns, replacement appliances—refrigerators, washers, dryers, stoves and microwave ovens—are continuing to move out of the stores. But the market for appliances for new housing is off because of the drop in construction, particularly single-family dwellings.

Meanwhile, one Western stamping contact told *Iron Age* that he has been been supplied with some defense contracts for aircraft in the second half of this year, and he is expecting a few orders from the commercial aircraft sector next year.

Nevertheless, he won't characterize the aerospace business as booming.

Thus, with the traditional surge in this quarter, one industry executive sizes up 1984 as an excellent year.

GEARS; VALVES

GEARS—Although the economic recovery has shifted into a more controlled pace now, an Eastern gear industry source says he's "feeling good" about the last quarter of this year and confident that growth will continue in 1985.

Overall, gearmakers sounded upbeat. As one told *Iron Age*, there is continuing good news out of Detroit, in spite of a possible GM strike. Also, sales of most appliance lines are holding at the third quarter level or even higher and gear manufacturers are benefiting from some recent aircraft orders.

The farm equipment market is a mixed bag. Some gearmakers see it as improving in 1985, others are sticking to their earlier doubts.

Although the farmers have been suffering so long from financial woes along with major weather disasters in many parts of the country, President Reagan's recent announcement of the resumption of wheat sales to Russia will undoubtedly put some U.S. farmers into a more equipment-buying mood. This probably won't be showing up as new orders until the first or second quarter of 1985.

Orders for machine tools could finish between 12 and 20 pct ahead of last year, one gear manufacturer felt.

Despite upward movement in orders for the last 15 months, profits for that industry are considered pretty dismal by the gear industry. As one gearmaker said, "They (machine tool orders) may be moving uphill, but it's like dragging a tire chain."

By product line, orders continue to be strongest now for precision and commercial-type gears for such consumer applications as vehicles, household appliances, pumps and agricultural markets; orders for larger types are still lagging, probably because of interest rates.

At the beginning of this year, U.S. gearmakers told *Iron Age* they were anxious to beat the 1983 blues. They certainly seem to be.

VALVES—The commercial construction industry may be having a field day lately and the chemical industry is expected to end 1984 some 13 pct ahead of last year, but it takes more than that to make this last quarter a hearty feast for valve makers.

According to valve industry forecasters, the industry will probably finish 7 pct ahead of last year while there could be a 9 pct increase for all of manufacturing.

The valve industry's predictions for 1984 and into 1985 are largely contingent on the capital spending of three prime end-users—petroleum, public utilities and chemical industries—which account for about two-thirds of their total sales.

On the plus side, the industry expects to see more demand for valves from the commercial building sector. Recent economic reports have shown that in July nonresidential building had risen some 29 pct over that of July 1983, while new plant expansions for this year could finish some 14 pct ahead of last.

There is a glut of office space, one report noted, and yet office buildings continue to mushroom, along with shopping centers and and large apartment complexes.

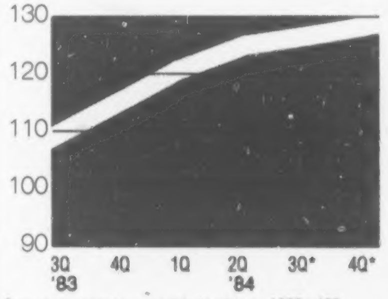
Although the chemical industry is expected to remain strong through next year, the petroleum industry is lagging. If some of the industry's excess capacity is absorbed, 1985 could see the petroleum industry boost its spending, resulting in more valve orders.

Meanwhile, the utilities seem to be winding down their capital spending.

Interpreted by one industry analyst, this would mean it will spend 5 pct through 1984 and no more than 3 pct next year.

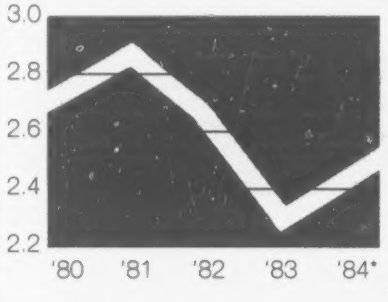
In good times the valve industry may not be as strong as other industries. Conversely, it usually doesn't suffer as much as some others do in bad times. It stays a more even course.

Orders continue to be strongest now for precision and commercial-type gears.



Gears, Bookings

Based on average monthly bookings. 1977=100
Source: American Gear Manufacturers Assn.
*IA estimate



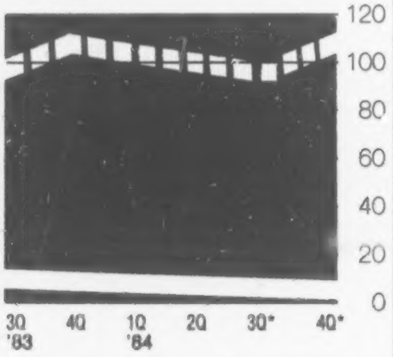
Valves, Shipments
Billions of Dollars

Source: Valve Manufacturers Assn.
*IA estimate

SHIPBUILDING; RAIL CARS

Construction may begin on 16 to 20 new Navy ships during the fourth quarter.

Shipbuilding
Commercial and Navy

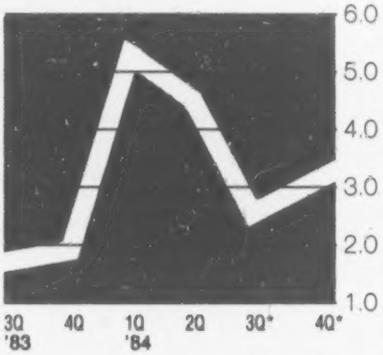


Source: Shipbuilders Council of America

Note: Commercial listing includes all commercial ships on order or under construction, 1,000 gross tons or over. Navy listing includes new construction of U.S. Navy ships, including Coast Guard cutters.

*IA estimate

Rail Car Orders
Thousands of Units



Source: American Railway Car Institute
*IA estimate

SHIPBUILDING—For all intents and purposes, the domestic construction of large ships is just about dead. As of Aug. 1, three commercial ships over 1,000 gross tons were being built in U.S. yards. By the end of the year, there will only be one such ship under construction in an American shipyard.

American ship owners are buying large commercial ships, but they are all being built in overseas' yards.

The construction of ships for the U.S. Navy is a different matter entirely. During the first quarter of 1984, 107 ships (including 11 Coast Guard cutters) were under construction. Second quarter Navy construction dropped to 100 ships and the third quarter dropped to about 95 vessels.

Shipyards have been keenly awaiting the fiscal year 1985 program which began today. It's anticipated that construction may begin on 16 to 20 new Navy ships during the fourth quarter as a result of the program. This could bring Naval construction up to 110 during the fourth quarter.

Under the new budget, $3.1 billion has been budgeted for the construction of three new CG-47 AEGIS cruisers. Another $1.1 billion has been earmarked for the Navy's first DDG-51 guided-missile destroyer of the Arleigh Burke class. The latter ship has been critically sought by the Navy. Contracts have not been awarded yet on either the CG-47 cruisers or the guided-missile destroyer.

The Electric Boat Division of General Dynamics Corp. and Newport News Shipbuilding & Dry Dock Co. are bidding on two new submarine contracts. One is a $1.7 billion contract for a new Trident submarine. The other is a $2.8 billion contract for four new SSN-688 attack submarines.

The big item in Naval ship conversion is the $422 million budgeted for the battleship, the USS Missouri. This work will be done at the Long Beach Naval Shipyard in California.

RAIL CARS—The topsy-turvy rail car industry continues to maintain its usual form. Just when the industry was trying to adjust to order clips of less than 1,000 cars per month, along came June. Orders jumped to 2,994, but dropped back to 934 in July.

Business is running well ahead of 1983, but it's still only a shadow of those 100,000 car years, last experienced in 1980. With luck, 1984 might be a 20,000 car year, as far as orders are concerned.

The second quarter this year showed a 10 pct decrease from a relatively strong first quarter. Although the final figures were not yet available, the third quarter appeared to be a severe—perhaps as much as 50 pct—drop in orders from the second quarter. The fourth quarter is expected to be a slight improvement over the third quarter but not as strong as the first two quarters.

According to the American Railway Car Institute, Chicago, 1,327 new freight cars were placed in service in July, compared with 1,771 in June and 289 in July 1983. As of Aug. 1, the backlog of cars on order but undelivered was 6,821 cars, compared with 7,267 on July 1, and 3,968 on Aug. 1, 1983. Average monthly backlog as of Aug. 21 was 6,525, compared with 4,310 at the same time last year.

Meanwhile, the Association of American Railroads (AAR), Washington, reported that 93 locomotives were placed in service in July, compared with 60 in June and 11 in July 1983.

In other new construction news, Conrail reportedly plans to build 250 gondolas in its own yards.

Nevertheless, despite the apparent glut of rail cars, freight traffic during the week ended Aug. 11 totaled an estimated 18 billion ton-miles, 9 pct above the corresponding week a year ago. ☐

Reprints available while supply lasts. For single copy, circle No. 80 on Inquiry Card. Additional copies, $1, for articles up to eight pages. Longer ones $2 each. Please include payment with orders of $10 or less. Quantity reprints available. For information write: IRON AGE, Reader Service, Chilton Company, Radnor, PA 19089. Ask for Reprint No. 1096.

PRICE & PRODUCTION DATA

(Effective September 17, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	159	181	183	176
Pittsburgh	197	187	222	180
Youngstown	97	73	82	93
Lake Erie	159	160	124	145
Detroit	120	143	161	84
Chicago	358	355	427	484
Cincinnati	85	89	83	100
St. Louis	74	50	71	73
Southern	166	161	175	150
Western	73	74	67	96
U.S. Production	1,488	1,473	1,595	1,613

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective September 17, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,488	1,473	68,873	57,440
Capability Utilization Rate	57.7	57.1	71.9	53.7

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.582	26.822
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 85.17	$ 85.17	$ 82.50	$ 77.17
No. 2 bundles	$ 51.50	$ 52.17	$ 51.50	$ 45.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 92.50	$ 92.50	$ 87.50	$ 82.50
No. 1 steel, Philadelphia	81.50	81.50	81.50	69.50
No. 1 steel, Chicago	81.50	81.50	78.50	79.50
No. 1 bundles, Detroit	77.50	77.50	70.50	75.50
Low Phos., Youngstown	80.50	80.50	80.50	84.50
No. 1 mach'y cast., Pgh	71.50	71.50	71.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi	115.50	115.50	115.50	109.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective September 17, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	46.00	46.68	9/17/84
Copper (C)	62.00-66.00	63.50-66.00	9/14/84
Lead	24.00-28.00	26.00-28.00	9/10/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	213.27	213.05	9/17/84
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	48.00	48.00-50.00	8/24/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) — cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$140.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$335.25
Indium, dollars per troy oz.	$3.30
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs.	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$315-$320
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$138
Platinum, per troy oz.	$329
Rhodium, per troy oz.	$700
Silver ingots, per troy oz.	$7.02
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Sept. 10—563.93
Sept. 11—563.27
Sept. 12—563.40
Sept. 13—562.88
Sept. 14—562.88

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	60½	59½
Yellow brass	56⅛	55¼
Red brass	57⅜	56½
Comm. bronze	57¾	57
Mang. bronze	59¼	51¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	54
No. 2 copper wire	45
Light copper	36

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	50
No. 2 copper wire	41
Light copper	32
No. 1 composition	53
No. 1 comp. turnings	51
Hvy. yellow brass solids	36
Hvy. yellow brass turnings	34
Radiators	40

Aluminum

New mixed clips	34	—35
Old sheet	31	—32
Old cast	31	—32
Clean dry borings	32	—33

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	33	—34
Mixed L.C. clips	28	—29
Old sheets and cast	25	—26
Borings and turnings	20	—21
Duraluminum clippings	26	—27

Copper and Brass

No. 1 copper wire	45	—46
No. 2 copper wire	37	—38
Light copper	33	—34
Radiators	32	—33
No. 1 composition	41	—42
No. 1 composition turn'gs	38	—39
Cocks and faucets	30	—31
Clean heavy yellow brass	29	—30
Brass Pipe	30	—31
New soft brass clippings	42	—43

Lead

Heavy soft lead	10	—11
Whole batteries	3	— 4
Type metal	16	—17
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	50	— 60

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE SEP. 17, 1984

(Effective September 17, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 92.00	to	$ 93.00
No. 2 hvy. melting	82.00	to	83.00
No. 1 dealer bundles	106.00	to	107.00
No. 1 factory bundles (auto)	95.00	to	96.00
No. 2 bundles	53.00	to	54.00
No. 1 busheling	109.00	to	110.00
Machine shop turn.	12.00	to	13.00
Shoveling turnings	51.00	to	52.00
Cast iron borings	49.00	to	50.00
Low phos. punchings plate	109.00	to	110.00
Heavy turnings	80.00	to	81.00
No. 1 RR hvy. melting	100.00	to	101.00
Rails 2 ft. and under	115.00	to	116.00
Scrap rails, random lgth.	101.00	to	102.00
RR specialties	107.00	to	108.00
No. 1 machinery cast	71.00	to	72.00
Cupola cast	64.00	to	65.00
Heavy breakable cast	30.00	to	31.00
Stainless			
18-8 bundles and solids	550.00	to	560.00
18-8 turnings	450.00	to	460.00

Chicago

No. 1 hvy. melting	$ 81.00	to	$ 82.00
No. 2 hvy. melting	74.00	to	75.00
No. 1 dealer bundles	99.00	to	100.00
No. 1 factory bundles (auto)	97.00	to	98.00
No. 2 dealer bundles	51.00	to	52.00
No. 1 busheling	100.00	to	101.00
Shredder scrap	97.00	to	98.00
Machine shop turn.	44.00	to	45.00
Mixed bor. and turn.	46.00	to	47.00
Shoveling turnings	50.00	to	51.00
Cast iron borings	47.00	to	48.00
Low phos. forge crop	115.00	to	116.00
Low phos. punchings plate ¼ in. and heavier	125.00	to	126.00
Low phos. 2 ft. and under	120.00	to	121.00
No. 1 RR hvy. melting	97.00	to	98.00
Scrap rails, random lgth.	99.00	to	100.00
Reroller rails	110.00	to	111.00
Rails, 2 ft. and under	119.00	to	120.00
RR couplers and knuckles	101.00	to	102.00
RR car axles	133.00	to	134.00
No. 1 machinery cast	115.00	to	116.00
Cupola cast	102.00	to	103.00
Stove plate	99.00	to	100.00
Steel car wheels	111.00	to	112.00
Stainless			
18-8 bundles and solids	490.00	to	500.00
18-8 turnings	420.00	to	430.00
430 bundles and solids	120.00	to	125.00
430 turnings	80.00	to	90.00

Philadelphia

No. 1 hvy. melting	$ 80.00	to	$ 83.00
No. 2 hvy. melting	71.00	to	74.00
No. 1 dealer bundles	95.00	to	98.00
No. 2 dealer bundles	48.00	to	51.00
No. 1 busheling	95.00	to	98.00
Shredder scrap	100.00	to	103.00
Machine shop turn.	29.00	to	32.00
Mixed bor. and turn.	29.00	to	32.00
Shoveling turnings	40.00	to	43.00
Low phos. 5 ft. and under	95.00	to	98.00
Low phos. 2 ft. punchings	116.00	to	119.00
Electric furnace bundles	101.00	to	104.00
RR specialties	98.00	to	101.00
Rails, 2 ft. and under	118.00	to	121.00
Cupola cast	75.00	to	78.00
Heavy breakable cast	57.00	to	60.00
No. 1 machinery cast	97.00	to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 59.00	to	$ 60.00
No. 2 hvy. melting	58.00	to	59.00
No. 1 dealer bundles	77.00	to	78.00
No. 2 bundles	39.00	to	40.00
No. 1 busheling	76.00	to	77.00
Drop forge flashings	49.00	to	50.00
Machine shop turn.	47.00	to	48.00
Mixed borings and turn.	26.00	to	27.00
Shoveling turnings	48.00	to	49.00
Cast iron borings	37.00	to	38.00
Heavy breakable cast	40.00	to	41.00
Mixed cupola cast	56.00	to	57.00
Automobile cast	80.00	to	81.00
Stainless			
18-8 bundles and solids	455.00	to	465.00
18-8 turnings	360.00	to	370.00
430 bundles and solids	110.00	to	120.00

Youngstown

No. 1 hvy. melting	$ 66.00	to	$ 69.00
No. 2 hvy. melting	47.00	to	50.00
No. 1 dealer bundles	79.00	to	82.00
No. 2 dealer bundles	35.00	to	38.00
Machine shop turn.	13.00	to	16.00
Shoveling turnings	18.00	to	21.00
Low phos. plate	79.00	to	82.00
Electric furnace bundles	76.00	to	79.00
Galvanized bundles	67.00	to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00	to	$ 63.00
No. 2 hvy. melting	37.00	to	40.00
No. 1 dealer bundles	73.00	to	76.00
No. 1 factory bundles	77.00	to	80.00
No. 2 bundles	19.00	to	22.00
No. 1 busheling	78.00	to	81.00
Machine shop turn.	8.00	to	11.00
Mixed bor. and turn.	8.00	to	11.00
Shoveling turnings	10.00	to	13.00
Cast iron borings	13.00	to	16.00
Cut structural & plates, 2 ft. and under	110.00	to	113.00
Low phos. punchings plate	110.00	to	113.00
Drop forge flashings	42.00	to	45.00
Foundry steel, 2 ft. & under	62.00	to	65.00
No. 1 RR hvy melting	79.00	to	82.00
Rails, 2 ft. and under	115.00	to	118.00
Rails, 18 in. and under	115.00	to	118.00
Steel axle turnings	59.00	to	62.00
Railroad cast	92.00	to	95.00
No. 1 machinery cast	102.00	to	105.00
Cupola cast	58.00	to	61.00
Stove plate	44.00	to	47.00
Stainless			
18-8 bundles	375.00	to	385.00
18-8 turnings	325.00	to	335.00
430 bundles	80.00	to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00	to	$ 68.00
No. 2 hvy. melting	56.00	to	57.00
No. 1 busheling	82.00	to	83.00
No. 1 dealer bundles	81.00	to	82.00
No. 2 bundles	37.00	to	38.00
Machine shop turn.	14.00	to	15.00
Mixed bor. and turn.	13.00	to	14.00
Shoveling turnings	17.00	to	18.00
Cast iron borings	22.00	to	23.00
Low phos. plate	97.00	to	98.00
Structural and plate, 2 ft. and under	100.00	to	101.00
Rails, 2 ft. and under	100.00	to	101.00
Scrap rails, random lgth.	76.00	to	77.00
No. 1 machinery cast	81.00	to	82.00
No. 1 cupola cast	61.00	to	62.00

St. Louis

No. 1 hvy. melting	$ 70.00	to	$ 71.00
No. 2 hvy. melting	59.00	to	60.00
Foundry steel, 2 ft.	70.00	to	71.00
No. 1 dealer bundles	70.00	to	71.00
No. 2 bundles	54.00	to	55.00
Machine shop turn.	17.00	to	18.00
Shoveling turnings	23.00	to	24.00
Cast iron borings	27.00	to	28.00
No. 1 RR hvy. melting	70.00	to	71.00
Rails, random length	72.00	to	73.00
Rails, 18 in. and under	93.00	to	94.00
RR specialties	87.00	to	88.00
Cupola cast	72.00	to	73.00
Heavy breakable cast	50.00	to	51.00
Stove plate	83.00	to	84.00
Steel car wheels	101.00	to	102.00
Rerolling rails	80.00	to	81.00
Unstripped motor blocks	61.00	to	62.00

Birmingham

No. 1 heavy melting	$ 75.00	to	$ 76.00
No. 2 heavy melting	67.00	to	68.00
No. 1 dealer bundles	75.00	to	76.00
No. 2 bundles	52.00	to	53.00
No. 1 busheling	75.00	to	76.00
Shredder scrap	97.00	to	98.00
Machine shop. turn.	29.00	to	30.00
Shoveling turnings	43.00	to	44.00
Cast iron borings	43.00	to	44.00
Electric furnace bundles	67.00	to	68.00
Elec. furnace, 3 ft. & under	73.00	to	74.00
Structural and plate, 2 ft.	105.00	to	106.00
Structural and plate, 4 ft.	94.00	to	95.00
No. 1 RR hvy. melting	94.00	to	95.00
Scrap rails, random lgth.	90.00	to	91.00
Rails, 2 ft. and under	108.00	to	110.00
Angles and splice bars	92.00	to	93.00
No. 1 cupola cast	87.00	to	88.00
Unstripped motor blocks	69.00	to	70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 61.00	to	$ 62.00
No. 2 hvy. melting	58.00	to	59.00
No. 1 dealer bundles	75.00	to	76.00
No. 2 bundles	34.00	to	35.00
Machine shop turn.	6.00	to	7.00
Shoveling turnings	8.00	to	9.00
Cast iron borings	21.00	to	22.00
Low phos. 18 in. and under	93.00	to	94.00
Rails, random length	75.00	to	76.00
Rails, 2 ft. and under	90.00	to	91.00
No. 1 cupola cast	63.00	to	64.00
Heavy breakable cast	29.00	to	30.00
Drop broken cast	82.00	to	83.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00	to	$ 52.00
No. 2 hvy. melting	41.00	to	43.00
No. 2 dealer bundles	23.00	to	27.00
Mixed bor. and turn.	11.00	to	13.00
Machine shop turn.	6.00	to	7.00
Shoveling turnings	14.00	to	15.00
Clean cast. chem. borings	35.00	to	36.00
No. 1 machinery cast	89.00	to	90.00
Mixed yard cast	50.00	to	51.00
Heavy breakable cast	10.00	to	12.00
Stainless			
18-8 prepared solids	490.00	to	510.00
18-8 turnings	390.00	to	410.00
430 prepared solids	90.00	to	110.00
410 solids	80.00	to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00	to	$ 70.00
No. 2 hvy. melting	58.00	to	60.00
No. 1 dealer bundles	70.00	to	71.00
No. 2 bundles	41.00	to	43.00
No. 1 busheling	78.00	to	80.00
Shredder scrap	76.00	to	78.00
Machine shop turn.	14.00	to	16.00
Shoveling turnings	22.00	to	24.00
No. 1 machinery cast	85.00	to	90.00
Mixed cupola cast	56.00	to	58.00
Heavy breakable cast	14.00	to	15.00

San Francisco

No. 1 hvy. melting	$ 47.00	to	$ 49.00
No. 2 hvy. melting	41.00	to	43.00
No. 1 dealer bundles	37.00	to	39.00
No. 2 dealer bundles	19.00	to	21.00
Machine shop turn.	6.00	to	8.00
Cast iron borings	6.00	to	8.00
No. 1 cupola cast	81.00	to	83.00

Los Angeles

No. 1 hvy. melting	$ 48.00	to	$ 50.00
No. 2 hvy. melting	41.00	to	43.00
No. 1 dealer bundles	38.00	to	40.00
No. 2 dealer bundles	19.00	to	21.00
Machine shop turn.	10.00	to	12.00
Shoveling turnings	8.00	to	10.00
Cast iron borings	6.00	to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00	to	79.00
No. 1 cupola cast	75.00	to	77.00

Seattle

No. 1 hvy. melting	$ 70.00	to	$ 72.00
No. 2 hvy. melting	59.00	to	61.00
No. 2 bundles	41.00	to	43.00
No. 1 cupola cast	94.00	to	95.00
Mixed yard cast	84.00	to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 91.00
No. 2 heavy melting cut 2 ft. and under	85.00
No. 1 dealer bundles	92.00
No. 2 bundles	48.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	93.00
Bush. new fact. unprp'd.	83.00
Machine shop turn.	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	74.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 76.00	to	$ 77.00
No. 2 hvy. melting	61.00	to	62.00
No. 2 bundles	45.00	to	46.00
Machine shop turn.	16.00	to	17.00
Crushed turnings	34.00	to	35.00
Shredder scrap	78.00	to	79.00
Cut structural plate, 2 ft. and under	105.00	to	107.00
Cut structural plate, 5 ft. and under	89.00	to	91.00
Unstripped motor blocks	60.00	to	61.00
Cupola cast	80.00	to	81.00

PRODUCER KEY
With Principal Offices

A4	American Cladmetals Co., Carnegie, Pa.
A7	Armco Inc., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A11	Atlantic Wire Co., Branford, Conn.
B1	Baron Drawn Steel Corp., Toledo, Ohio
B3	Bethlehem Steel Corp., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Steel Co., Harvey, Ill.
C1	Calstrip Corp., Los Angeles
C6	CF&I Steel Corp., Pueblo, Colo.
C10	Copperweld Steel Co., Warren, Ohio
C11	Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Co., Birmingham, Ala.
C20	Calumet Steel Div., Chicago Heights, Ill.
C21	Cumberland Steel Co., Cumberland, Md.
D1	Detroit Strip Div., Cyclops Corp.
D2	Driver Wilber B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
E3	Enamel Products & Plating Co., McKeesport, Pa.
E4	Elliot Bros. Steel Co., New Castle, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
G6	Gibraltar Steel Corp., Buffalo, N. Y.
G7	Georgetown Steel Corp., Georgetown, S. C.
G8	Guterl Special Steel Corp.
H1	Hercules Drawn Steel Corp., Livonia, Mich.
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Steel Corp., Chicago
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K2	Keystone Consolidated Industries, Inc.
K3	Kentucky Electric Steel Co., Ashland, Kentucky
K5	Kemco Div., Foote Mineral Co., Keokuk, Iowa
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
L5	Litho-Strip Corp., Chicago
M2	McLouth Steel Products Corp.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M8	Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M11	Midwest Steel Div., National Steel Corp., Portage, Ind.
N1	Northeast Precision Steel Co., Boston, Mass.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle, Wash.
N9	Nelsen Steel & Wire Co., Chicago, Ill.
N10	North Star Steel Co., Saint Paul, Minnesota
O2	Oregon Steel Mills, Portland, Ore.
P2	Phoenix Steel Corp., Claymont, Del.
P9	Pacific States Steel Co., Niles, Cal
P14	Pacific Tube Co., Los Angeles
P15	Philadelphia Steel and Wire Corp., Phila.
R3	Republic Steel Corp., Cleveland
R4	Ramco Steel Co., Buffalo, N. Y.
R5	Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S10	Seneca Steel Service, Buffalo, N. Y.
S16	Southern Precision Steel Co., G[illegible]port, Miss.
T4	Thomas Steel Strip Co., Warren, O.
T5	Timken Company, Steel Division, Canton, O.
T7	Texas Steel Co., Fort Worth, Tex.
T9	Triumph Electro Corp., Chicago, Ill.
T10	Tennessee Forging Steel Corp., Harriman, Tenn.
T11	Teledyne Columbia-Summerill, Carnegie, Pa.
U1	United States Steel Corp., Pittsburgh, Pa.
W3	Weirton Steel Corp., Weirton, West Va.
W5	Wheeling-Pittsburgh Steel Corp.
W7	Wilson Steel & Wire Co., Chicago
W10	Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14	Whittaker Steel Strip Div., Detroit, Mich.

STEEL SERVICE CENTER PRICES

Price, Dollars per 100 lb

Prices are based on list prices reported to *Iron Age* by a number of metal service centers deemed representative by *Iron Age* and then weighted based in part on the reports received each month. Prices are not intended to reflect the actual transaction prices obtained by any individual metal service center.

Cities*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
City Delivery Charge*	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	29.65	33.55	34.48	31.63	27.02	23.28	19.55	31.25	34.34	50.60	69.58	73.19
Baltimore	26.90	30.72	37.59	39.82	34.75	28.80	22.60	38.65	57.45	64.70	71.71	75.11
Birmingham	26.60	32.82	34.59	31.64	26.64	23.01	19.99	30.91	49.31	58.90	68.10	74.43
Boston	34.94	40.19	45.64	47.54	35.34	30.06	23.59	40.29	47.92	51.02	58.48	63.50
Buffalo	31.10	35.68	41.89	40.15	32.59	27.12	19.86	37.75	44.15	47.85	53.92	59.84
Chicago	29.26	34.62	37.84	31.09	24.46	21.09	17.70	33.57	42.86	42.94	47.38	52.75
Cincinnati	28.91	34.58	37.16	30.85	24.84	20.75	17.96	32.96	37.16	42.54	46.63	52.44
Cleveland	28.48	34.22	37.46	36.74	26.92	26.13	18.81	38.34	42.14	45.56	49.98	55.88
Denver	33.62	38.88	40.88	36.36	34.45	28.66	21.62	44.31	52.10	60.06	67.39	75.21
Detroit	29.21	35.65	37.87	31.39	26.63	23.86	16.96	32.71	37.18	42.51	46.81	53.49
Houston	33.49	33.47	38.79	43.62	30.10	28.46	24.22	42.05	47.76	55.05	61.50	68.69
Kansas City	31.68	36.89	40.00	36.07	28.03	30.31	20.13	35.00	42.70	47.64	53.21	60.30
Los Angeles	28.68	34.90	38.63	42.22	34.75	36.18	27.29	43.06	54.80	60.63	65.43	72.14
Memphis	26.37	32.51	35.34	33.57	27.75	26.63	21.40	33.87	36.78	49.96	59.80	69.44
Milwaukee	29.35	34.89	37.85	31.43	25.37	22.18	17.58	32.47	37.54	42.78	46.50	53.06
New York	32.47	38.99	42.55	43.38	33.96	27.21	21.08	40.88	45.78	49.07	61.12	65.86
Philadelphia	30.41	38.99	41.23	43.50	31.05	28.11	20.85	39.24	46.18	50.25	61.22	65.42
Pittsburgh	35.27	40.97	45.23	43.45	37.60	30.44	21.29	29.80	41.40	47.58	53.03	60.02
Portland	28.96	32.08	38.73	36.93	32.88	34.78	27.87	44.85	49.78	57.74	70.44	....
San Francisco	29.08	34.33	39.15	42.73	35.98	35.38	26.70	44.22	52.75	60.38	67.30	73.42
Seattle	24.08	32.19	36.23	34.23	24.23	27.32	26.63	40.03	53.07	63.70	71.05	75.81
Spokane	21.21	30.42	35.65	38.02	35.00	33.77	21.97	43.01	43.20	47.52	....	58.32
St. Louis	29.11	34.60	37.31	34.59	26.19	22.90	18.40	33.87	38.12	43.51	48.85	53.69
St. Paul	28.87	33.61	36.69	38.36	26.91	23.73	17.70	33.98	37.52	42.72	47.09	53.31

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2¹⁵⁄₁₆; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

Codes identify Producers listed in the Key on page 84. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(2), C10, U1	$473.00
R3	$453.00
Midwest	
R3, W5	$453.00
S1, U1, I3	$473.00
C10	$473.00
K2	$453.00
West	
B3(2)	$463.00
C6	$453.00
Alloy, East	
R3,	$492.00
B3, U1, C10	$512.00
Midwest	
W5	$492.00
U1, C10, I3	$512.00
R3	$492.00
S1	$512.00
West	
B3	$502.00
C6	$469.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3	22.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
B3	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	22.90
U1, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
C6	24.15

Strip

Hot-Rolled, Carbon, Cut II Edge—all widths, East	
U1, B3	23.75
J3	22.05
Midwest	
D1	22.05
I4	22.85
J3, D1, W3	22.05
G2, G3	23.45
N4	22.55
W5, S1, A7	23.75
U1, B3, I3	23.75
M2, R3	22.05
West	
B3	26.55
South	
R3	22.05
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
S10	29.60
P15	24.80
B4	36.60
G6	36.175
Midwest	
I4	38.30
W14	32.80
J4	34.05
S1	37.05
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)*	
Midwest	
M2, R3, W3, J3, I3	22.05
G2, G3	23.45
S1	23.75
A7	25.35
South	
R3	22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge	
Midwest	
S1	37.05
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	26.10
I4	25.20
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
B4	47.25
P15	32.10
Midwest	
I4	44.30
S1	44.80

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	23.75
J3	22.05
U1	23.75
Midwest	
M2, R3, W3	22.05
D1, J3	22.05
G2, G3	23.45
I4	22.45
U1, W5, S1, B3, I3, A7	23.75
West	
U1	24.25
South	
R3	22.05
Cold-Rolled, East, Class I	
B3(2)	28.15
J3	26.15
U1	28.15
Midwest	
R3, M2, W3	26.15
G2, G3, M11	27.85
I4	22.00
J3	26.15
D1	26.15
U1, W5, S1, B3, I3, A7	28.15
West	
U1	28.65
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	30.30
U1	30.30
Midwest	
J3, D1, W3	28.00
R3, Y1	28.00
G2, M11	30.00
U1, W5, S1, I3, A7	30.30
West	
U1	30.80
South	
R3	28.00
Enameling, Midwest	
U1, S1, I3, A7	29.65
J3	27.65
Long-Terne, Midwest	
W5, A7	31.65
U1	31.65
R3	29.35

Wire Rod

East	
B3(2)	22.35
Midwest	
N4, K2	22.35
U1	24.10
A7	22.00
West	
C6	21.45
South	
G7	22.35

Tinplate

Electrolytic Tinplate	
Single Reduced (70 lb)	
East	**per base box**
J3	$26.29
U1	27.74
B3	27.54
Midwest	
U1	$27.74
J3	26.29
M11	27.24
W3	26.29
W5	27.74
West	
U1	$28.24
South	
U1	$27.74
Double Reduced (55 lb)**	
Midwest	
M11	$21.87
J3	21.49
U1	22.37
W3	21.49
W5	22.37
West	
U1	$22.87
South	
U1	$22.37
Black Plate	
Single Reduced (75 lb)*	
East	
B3	$24.31
Midwest	
J3, W5	$24.01
I3, W5	24.57
W3	24.01
U1, M11	25.26
West	
U1	$25.26
Double Reduced (55 lb)	
East	
B3	$20.49
Midwest	
M11	$19.70
W5	19.70
J3	18.93
W3	18.93
W5	18.93
U1	19.70
West	
U1	$19.70
South	
U1	$19.70

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	25.80
R5	25.80
J3	25.80
U1, C10, B3(3)	27.05
Midwest	
I4	23.95
U1, I3	27.05
R3, T10, C20, N4	25.80
K2	25.80
I3	22.00*
A7	20.25
West	
B3	25.80
C6	24.45
South	
A8	20.65
C16	25.80
Cold-Finished Carbon, East	
A11	22.15
R3	33.75
C21	21.15
J3(4), L2	31.00
M8, W10, T11, S8	31.00
N1	24.475
R4	33.25
B4	33.25
C10	31.00
Midwest	
W10, R3, M9	33.25
J3	31.00
B1	33.45
L2	30.75
N9	31.00
W14	22.20
B5	34.75
West	
R3	37.15
South	
J3	34.00
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
R5, K3	27.95
R3, J3	27.95
U1, B3(2), C10	29.20
Midwest	
R3	27.95
I3, C10, U1	29.20
I4	26.10
I3	23.50*
A7	20.25
West	
B3	27.95
C6	26.60
South	
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1	37.90
R4	37.10
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
Midwest	
R3	37.35
J3, W10, C10	34.85
B1	37.30
N9	34.85
L2	34.65
B5	38.60
M9	37.10
West	
R3	40.75
South	
J3	35.85
C16	28.00

Plates

Carbon Steel, East	
B3	23.25
L4, U1	25.75
P2	25.75
J3	26.75
Midwest	
B3	23.25
I3	25.75
J3, A7	22.80
U1, I4, S1	25.75
R3	26.75
West	
C6	24.25
U1, B3	25.75
O2	23.00
South	
R3	25.75
U1	25.75
Alloy, East	
B3	31.05
U1, L4	33.55
P2	33.55
J3	34.55
Midwest	
B3	31.05
G2, G3	33.55
I4, U1	33.55
West	
B3	33.55
O2	31.00
South	
U1	33.55

Wire

Carbon Steel Wire, East	
B3	27.10
A11	22.15
Midwest	
R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
C6	24.95

PRICES TURNED DOWN IN AUGUST

Producer prices, after charting a stable course for the April-June period and rising slightly in July, dropped a little in August, the U.S. Bureau of Labor Statistics reported.

The drop was 0.1 pct, but it sent the pessimists scrambling for their black crepe, the better to proclaim the death of the economic recovery. The August drop was, in fact, the first tumble in eight months.

Among finished goods other than foods and energy, prices increased "moderately," the government said. Capital equipment prices moved up 0.3 pct following an advance of 0.2 pct in July. That category represents 22.2 pct of the total producer price index.

Increases for light motor trucks, machine tools and mining machinery more than offset declines for heavy trucks, chemical industry machinery and plastics industry machinery. Autos' prices rose a slight 0.1 pct, mechanical power transmission equipment went up 0.5 pct, but pumps and compressors' tags dropped 0.5 pct.

Increases compared with July were logged by valves and fittings—0.8 pct—and miscellaneous metal products, 0.3 pct. Prices for most nonferrous metals continued to fall, down 0.4 pct.

The index for intermediate goods, supplies and components declined 0.2 pct, on a seasonally adjusted basis, the same as in July.

For machine tools, there was no change in prices for metal forming products and a slight 0.3 pct rise in charges for metal cutting equipment. Overall, of the 22 categories shown, 20 either went up in price or were unchanged, only light motor trucks and pumps, compressors and allied equipment registered drops. All prices were up compared with August 1983.

Analysts have been predicting slightly higher increases in producer prices and overall moderate inflation rate of about 4 pct for all of 1984.

Latest Month Covered: August 1984

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	385.1	+ 0.3	+ 2.1
Metal Forming Machine Tools	425.1	0	+ 2.2
Agricultural Machinery & Equip.	337.6	+ 0.1	+ 3.1
Construction Machinery & Equip.	358.6	+ 0.1	+ 1.6
Industrial Process Furnace & Ovens	376.0	+ 0.4	+ 3.6
Industrial Material Handling Equip.	290.3	+ 0.4	+ 1.8
Pumps, Compressors & Allied Equip.	348.1	− 0.5	+ 0.7
Fluid Power Equip. (Dec. 1970 = 100)	260.7	+ 0.2	+ 2.8
Mechanical Power Transmission Equip.	327.9	+ 0.5	+ 4.1
Automobiles	221.3	+ 0.1	+ 1.3
Motor Trucks—Light	281.7	− 0.2	+ 4.1
Motor Trucks—Heavy	334.7	0	+ 6.8
Railroad Equipment	364.6	+ 0.3	+ 3.9
Fabricated Metal Structural Products	312.3	+ 0.2	+ 3.1
Electric Motors	340.3	0	+ 1.6
Valves & Fittings (Dec. 1982 = 100)	102.7	+ 0.8	+ 3.2
Ball & Roller Bearings	343.6	+ 0.1	+ 3.7
Cutting Tools & Accessories	278.9	+ 0.1	+ 1.9
Heating Equipment	255.5	+ 0.3	+ 4.2
Plumbing Fixtures & Brass Fittings	303.3	+ 0.3	+ 4.5
Metal Containers	352.4	+ 1.1	+ 4.7
Miscellaneous Metal Products	295.0	+ 0.3	+ 3.9

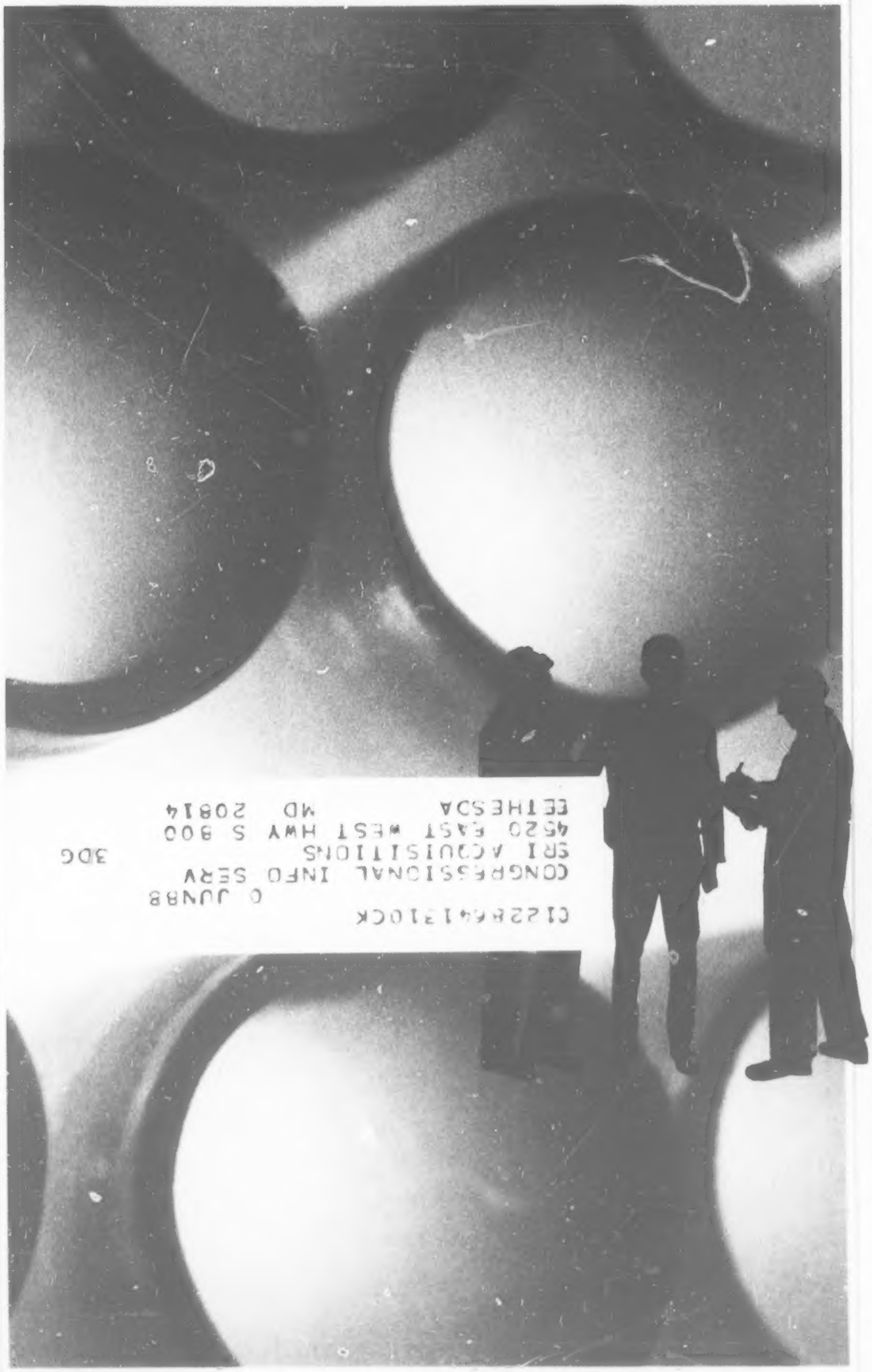
Data based on U.S. Labor Dept.'s Producer Price Index

CHILTON'S

October 15, 1984

IRON AGE

METALS PRODUCER



C1228641310CK
0 JUN88
CONGRESSIONAL INFO SERV
SRI ACQUISITIONS 3DG
4520 EAST WEST HWY S 800
BETHESDA MD 20814

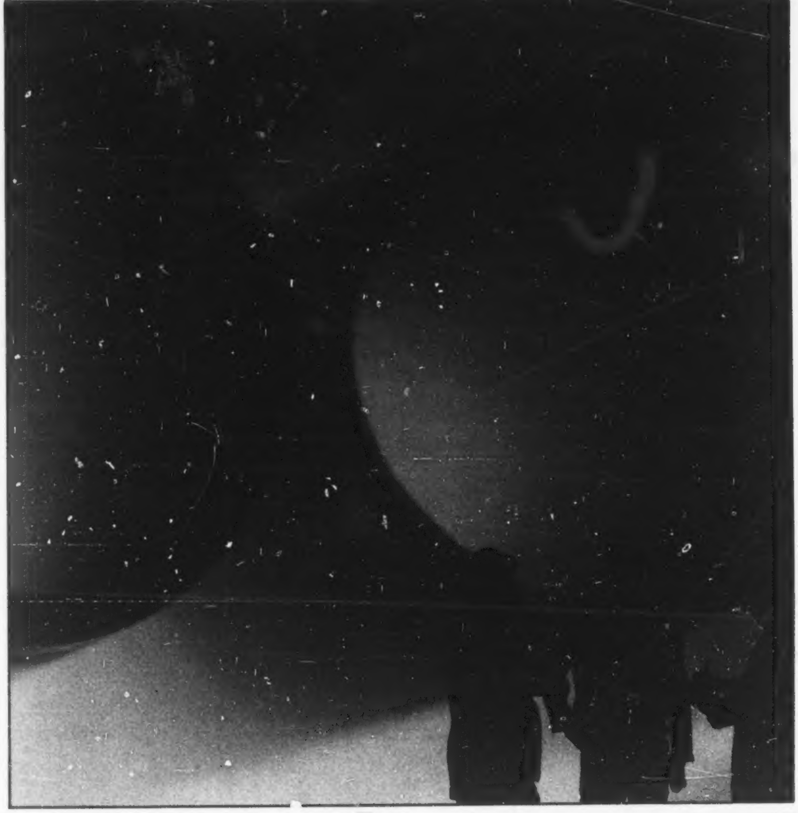
HARD TIMES IN WORLD STEEL – IS ITS MANAGEMENT GOOD ENOUGH?

In Plant Spotlight: Mannesmann Takes the Wraps off a New Roll Grinder

The Hot Spot: Stelco and Sandvik Debate the Trade Question

OCTOBER 15, 1984 VOL. 227, NO. 20

CHILTON'S
IRONAGE
METALS PRODUCER



Editorial 5
You can say all this, but . . .

Newswatch 11
A-L achieves a breakthrough in stainless strip

You and Your Job 22
The transfer of management power must be orderly.

The Hot Spot 25
Why Canada's steel situation differs.

Steel Management 37
What voluntary quotas mean to world steel.

Steel Imports 52
Have domestic producers found a solution to import woes?

Quality, What It Takes 61
Electric arc furnace meltdown feature boosts output.

In-Plant Spotlight 63
Mannesmann's secret roll grinder is revealed.

Technically Speaking 72
Special thread developed for seamless casing.

Materials Report 97
The steel market is unfazed by auto contract and import plan.

Order Trends 108
Durable goods orders post a modest 0.4 pct rise.

Next Issue: Combined blowing in Q-BOP vessels.

Departments

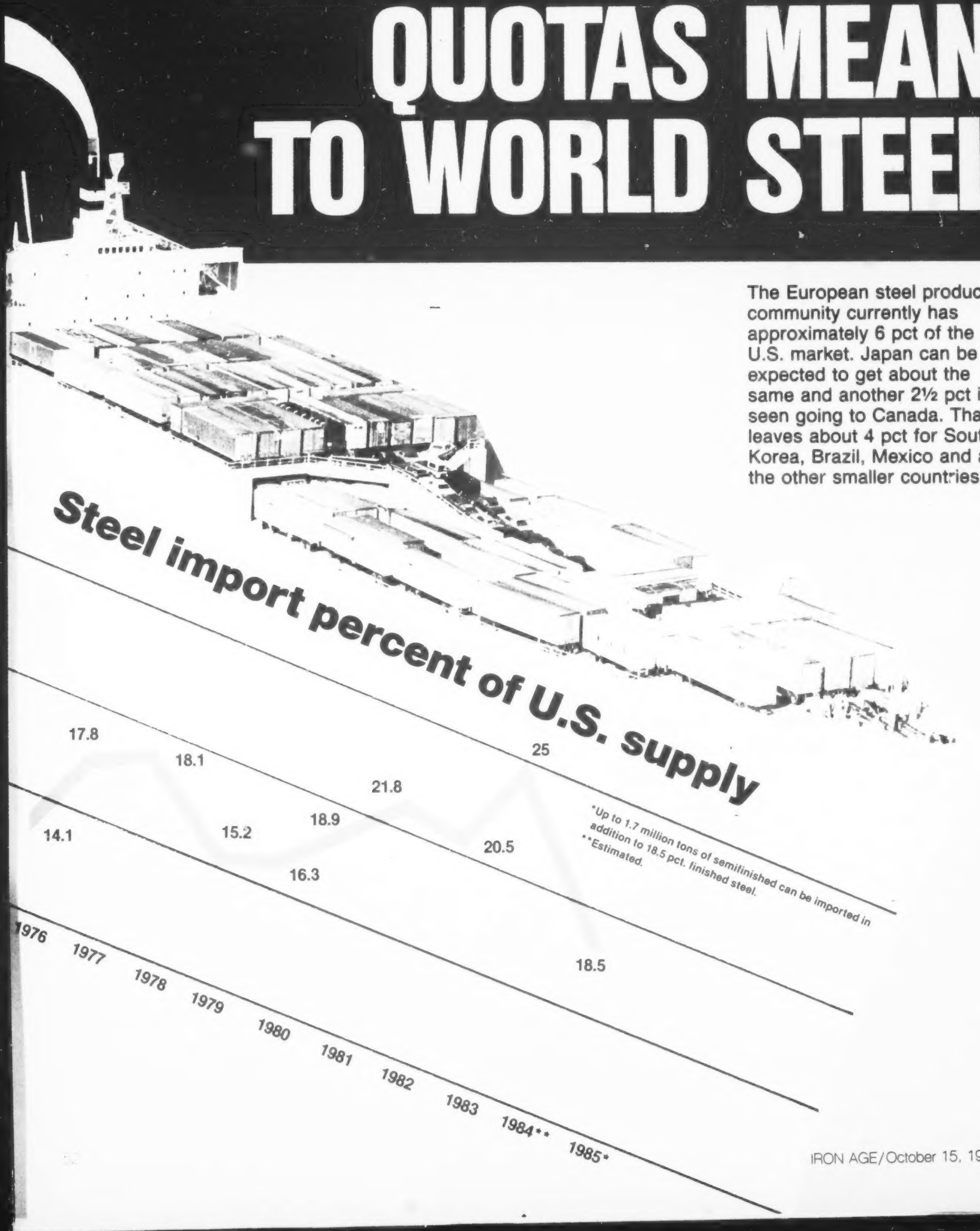
EDITORIAL STAFF 7
SIGNED, SEALED AND DELIVERED 8
INDUSTRIAL BRIEFS 11
PRODUCT & EQUIPMENT REVIEW 75
BOOK REVIEW 94
PERSONNEL TOUCH 96
MANAGEMENT SERVICE CARD 100
BUSINESS STAFF 101
AD INDEX 101
P&P DATA 10/1/84 103
FERROUS SCRAP 10/1/84 105
CLEARING HOUSE 106

IRON AGE (ISSN 0164-5137) is published 24 times a year by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $42 one year. Canada, $69 year. Foreign, $69 one year. Single copies, $2.50. Cable Chilton Philadelphia.
Send address changes to IRON AGE, P.O. Box 1440, Riverton, N.J. 08077

Chilton
abc
ONE OF THE ABC PUBLISHING COMPANIES

WHAT VOLUNTARY QUOTAS MEAN TO WORLD STEEL

The European steel producing community currently has approximately 6 pct of the U.S. market. Japan can be expected to get about the same and another 2½ pct is seen going to Canada. That leaves about 4 pct for South Korea, Brazil, Mexico and all the other smaller countries.



Steel import percent of U.S. supply

*Up to 1.7 million tons of semifinished can be imported in addition to 18.5 pct. finished steel.
**Estimated.

BY GEORGE MCMANUS

U.S. steel producers are hoping they have at long last found a good solution to their import problems.

Under a program announced by the Reagan Administration, imports of all carbon steel will be limited by voluntary agreements.

The limit on finished products will be 18.5 pct. It will take place immediately and run for five years. There will supposedly be provision for enforcement.

In their reactions, domestic producers offered tentative endorsements of the program.

"If implemented, as designed, it would effectively reduce imports from the 33 pct level of July to slightly more than 18 or 19 pct," said David M. Roderick, chairman of United States Steel Corp.

The proposed limit is a "fair one", said Frank W. Luerssen, chairman of Inland Steel Co. "...the enforcement mechanism will play a critical role." He called for a licensing arrangement similar to that now covering most products imported from Europe.

Not enthusiastic about the Reagan proposal was Rep. Joseph Gaydos (D., Pa.), chairman of the House Steel Caucus. The effectiveness of the program depends on the integrity of foreign governments and the sincerity of the Administration in forcing compliance, said Mr. Gaydos.

"I wouldn't bet the mortgage on either one," he said. "Foreign governments have violated such agreements in the past and it was the failure of our government to enforce our trade laws that helped put steel in the mess it is in today."

Equally skeptical was Lynn Williams, president, United Steelworkers of America (USWA). The Steelworkers are strongly committed to the defeat of President Reagan, and it's hardly surprising that the union was critical of the President's plan.

As Mr. Gaydos indicated, the actual effect of the plan will depend on the determination of the Reagan Administration. If the full weight of the government is thrown behind the voluntary plan, you will have something close to a formal, involuntary quota.

Without tough negotiation and enforcement, the program could simply result in 'rubberband agreements.' The current European agreement on pipe and tubing illustrates how flexible voluntary restraint can be. In the first six months of 1984, European shipments of oil country seamless came to 22 pct of the market. The limit is supposed to be 8.76 pct.

On the other hand, major portions of the Common Market agreement demonstrate that voluntary accords can be effective. The Europeans have held to specified limits on products covered by licensing and subject to U.S. rejection.

Assuming the new agreements are negotiated and enforced, it will be some time before the effects can be identified.

Earlier, the Congressional Budget Office estimated that a 15 pct steel quota would mean a 26.6 pct steel price increase in 1985. Even without quotas, the agency said, steel prices would go up 16 pct next year.

Others have also warned that trade curbs would have dire price consequences. "Protecting steel would drive up prices and restrain demand for autos, durable goods like refrigerators," wrote Tom Wicker (*New York Times*, Aug. 31, 1984). "Higher steel prices will excite a consumer reaction, too..."

Price Movement?

It's ironic that people keep suggesting the steel industry is about to gouge the public. The fact is that steel prices haven't gone up since 1981 and are being vigorously slashed right now. Price weakness was the main cause of the $6 billion loss in 1982 and 1983.

Steel producers would love to raise prices. Some restoration is urgently needed, but industry leaders doubt that sustained escalation will be possible.

"Our annual plans, our five-year plans—they do not include price increases," said Howard M. Love, chairman of National Intergroup, Inc. "They include cost decreases..."

In the current situation, it isn't expected there will be an abrupt cut of imports. Even though compliance is supposed to start Oct. 1, it's expected that continued heavy shipments will move imports for the year to 25 million tons.

A portion of this tonnage will probably impact 1985 markets and contribute to extended price weakness. When and if voluntary agreements do take effect, they will allow generous quantities of foreign steel into the country.

In this connection, the 18.5 pct share planned for imports is high by all historical standards. From 1975 to 1980, imports averaged 16 pct of U.S. supply. In 1977, when imports contributed to a major price collapse, the foreign share was 17.8 pct.

By accident or design, foreign producers created a convenient straw man when they upped shipments in 1984. From 20.5 pct in 1983, the import share rose to more than 25 pct in the first seven months of 1984. That left room for the Administration to make a sharp cut while still leaving imports with about one-fifth of the market.

"You're talking about imports being about 1 pct less than the average of the last three years," said a steel analyst.

The foreign share is coming out of a very weak market. "The industry now is operating at 57 pct of capacity," said Mr. Roderick. "Until the domestic market strengthens, I don't think this (the import program) is going to make any meaningful change in pricing."

Nevertheless, the planned program was considered a lot better than nothing. "It's going to add a greater degree of stability," said an official. In the past, the unpredictable spurts and swoops of imported steel have made for disruption, he said.

He also noted that while 18.5 might be high by past standards there was no guarantee that imports wouldn't go to 40 or 50 pct of the market. The 33 pct share in July provided one warning in this regard. And the proposed 18.5 pct limit does represent a yearly reduction of 5 million or 6 million tons from the most recent levels.

The 18.5 pct is considered firm and specific by steel producers. There were reports that the Administration regarded that number as a ballpark target.

"The commitment discussed with this Administration was that the importation of steel mill products into this country would be limited by voluntary agreements to 18½ pct," said Mr. Roderick. "And if they don't do it, as far as I'm concerned, they will have broken a commitment... There was no confusion. It was a commitment, not a target."

The crunch in negotiating agreements will probably come in the more than 15 smaller countries. The Europeans now have about 6 pct of the U.S. market. Japan can be expected to get about the same and another 2½ pct is seen going to Canada.

That leaves about 3½ to 4 pct for South Korea, Brazil, Mexico and all the other smaller countries. These countries have been accounting for 14 pct of U.S. supply.

No Limit on Shipments

Needless to say, no one will volunteer to limit shipments without considerable pressure. The pressure will be provided by the numerous dumping and subsidy cases in the works.

"Some of the cases we have out there are very, very powerful," said Mr. Roderick. "We have duties against certain countries that are like 70-80 pct. That means they are totally out of the market unless they can somehow remove those duties.

"So in effect, they are buying a piece of the market and they are buying freedom from a lot of suits. So there's tremendous leverage out there on the part of our negotiators."

The trade suits and the penalties will be dropped when agreements are negotiated. One exception will be semifinished steel. The program allows 1.7 million tons of semifinished to be imported.

"To assure that one domestic producer is not getting an advantage over another domestic producer," said Mr. Roderick, "we have insisted in the case of semi-finished that individual producers reserve the right to file suits..."

Another steel official spoke of a contest to see who gets the allotted semifinished.

Enforcement of the voluntary agreements will be through a number of measures.

The government's announcement refers to "vigorous and comprehensive action against unfair trade practices. ...The Department of Commerce will continue to rigorously enforce our unfair trade laws."

Actually, of course, the voluntary program will be in lieu of trade law enforcement.

The trade suits could be revived if foreign countries failed to abide by agreements, but that would simply put domestic mills back where they were to start with.

Also mentioned in the Administration release is the possibility of invoking Section 301 of the Trade Act. This section gives the President broad power to deal with trade problems. In the case of specialty steel, a long procedure under 301 brought a remedy that consisted of another long action under Section 201.

The key enforcement instrument may be legislative authority under a 626 bill. "If they begin to exceed their commitment during that five-year period," said Mr. Roderick, "our government would have the power through 626 legislation to stop those tons at the border."

This legislation is in effect for licensed products of the European steel agreement. As has been noted, the combination of European control and U.S. power has kept most of the imports to the negotiated quantities.

Tubular producers weren't covered by licenses or 626. Common Market officials argued that pipe and tubing were outside their sphere. Imports of the tubular grades have zoomed.

Overages have also developed for wire, nails, black plate and a few other products not covered by licenses. Problems developing for these products are supposed to be dealt with by consultation and ultimately licensing. There have been problems but there have been no consultations.

Equally unsatisfactory to domestic producers is the understanding that has supposedly been limiting imports from Japan. In arguments against steel trade curbs, this understanding is frequently cited as something firm and specific.

"Nobody knows what it is," said Mr. Roderick. "It's just something that is very vague."

It appeared for a while that the Japanese were tracking the European agreement. In the first seven months of 1984, however, steel imports from Japan rose 85 pct and exceeded the European volume by about 600,000 tons.

In short, past experience suggests that effective voluntary restraints will require definite measures for monitoring and controlling imports. With this in mind, the Administration has promised to "support legislation in the Congress to make enforceable at our borders all voluntary agreements and surge control arrangements."

626 Legislation

The timing and nature of this legislation could be crucial. "There is a 626 up in the Senate right now," said Mr. Roderick. He noted in late September that there were only eight more days before Congress recessed.

"We have committed that the 626 to be sought will be a clean bill," said Mr. Roderick. "We will try not to create a Christmas Tree."

Unhappily, this is exactly what the industry may get under legislation sponsored by Daniel Rostenkowski (D., Ill.), chairman of the House Ways and Means Committee. Proposed as an amendment to the broad trade bill is the Steel Import Stabilization Act.

The amendment includes the 626 authorization, but it also has such ornaments as Congressional review of steel investments and reportedly something about 'price discipline.'

"It sounds like national industrial policy," said one chief executive.

So there are a few loose ends to be nailed down before the Reagan Administration's program can really be evaluated. Steel producers have reservations, but none of the other options were particularly promising.

A legislated 15 pct steel import quota was being sought. "Would you rather have 15 pct than 18½ pct? Sure, I'd rather have 15 pct," said Mr. Roderick. "But the best we could get was 18½."

It was highly unlikely that the industry could have gotten the 15 pct legislation. The limited quotas recommended by the International Trade Commission (ITC) would have helped sheet producers but would have hurt others.

The final option for steel producers was just to keep filing dumping and subsidy complaints. This is an agonizingly slow process and at best, provides very narrow remedies. It is almost impossible to nail every product from every country.

The voluntary program was probably the steel industry's best bet, but there are those with misgivings. "In this time frame, I don't trust any politician," said a staff man.

Before the 90 days for negotiating agreements have expired, he noted, the Presidential election will be over. "If the Reagan Administration loses," he said, "they won't be running things. If they win, they won't have to be nice to the steel industry." ☐

PRICE & PRODUCTION DATA

(Effective October 1, 1984)

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	125	124	181	175
Pittsburgh	221	230	197	202
Youngstown	88	99	76	104
Lake Erie	137	159	141	139
Detroit	120	116	142	104
Chicago	302	350	366	480
Cincinnati	79	81	96	102
St. Louis	73	74	53	69
Southern	152	159	157	141
Western	67	70	66	95
U.S. Production	1,364	1,462	1,475	1,641

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)	gross-ton 80.50-86.9*
Mesabi, regular-unscreened	gross-ton $32.53
Mesabi, non-bessemer	gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.

86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

**Effective 8/1/83.

STEEL PRODUCTION, COMPOSITE PRICES

(Effective October 1, 1984)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1984	To Date 1983
Net tons, in thousands	1,364	1,462	71,671	60,695
Capability Utilization Rate	52.9	56.7	71.0	53.9

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 7/1/84)	27.582	27.582	27.582	26.822
Pig Iron** (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.*** (Gross ton=2240 lbs.)	$ 83.84	$ 85.17	$ 84.50	$ 77.50
No. 2 bundles	$ 51.50	$ 51.50	$ 52.17	$ 46.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh	$ 88.50	$ 92.50	$ 90.50	$ 82.50
No. 1 steel, Philadelphia	81.50	81.50	81.50	70.50
No. 1 steel, Chicago	81.50	81.50	81.50	79.50
No. 1 bundles, Detroit	75.50	77.50	77.50	81.50
Low Phos., Youngstown	80.50	80.50	80.50	84.50
No. 1 mach'y cast., Pgh	71.50	71.50	71.50	74.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	95.50
No. 1 mach'y cast., Chi	115.50	115.50	115.50	109.50

*Finished Steel Composite: Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite: Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite: Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS PRICES

(Effective October 1, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum (LME)	46.08	45.28	10/1/84
Copper (C)	61.00-62.00	62.00-	9/20/84
Lead	23.00-26.00	22.00-26.00	9/24/84
Magnesium Ingot	148.00	143.00	5/25/84
Nickel (LME)	213.58	213.23	10/1/84
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	45.00	45.00-48.00	9/21/84

ALUMINUM: Avg. for last week & previous week. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. delivered. NICKEL: Avg. for last week & previous week. Canada. ZINC: high grade.

Antimony, American Laredo, Texas	$2.00
Beryllium-aluminum 5% Be, per lb. contained Be	$230.00
Beryllium-copper, per lb. cont. Be	$140.00
Beryllium 97% powder 200	$178.00
Cadmium, ton lots	$1.55
Calcium, ton lots, crown	$3.58
Chromium, 99.8%	$3.75
Cobalt, 99%, cathode	$12.50
Gold per troy oz.	$345.40
Indium, dollars per troy oz.	$3.30
Iridium, dollars per troy oz.	$500
Magnesium sticks, 10,000 lbs	$1.97
Mercury, per 76-lb. f.o.b. N.Y.	$320-$327
Molybdenum, lb. tech. moly oxides, 20 lb. MO can	$6.85
Nickel electro (PDCR)	$3.29
Palladium, per troy oz.	$138
Platinum, per troy oz.	$322
Rhodium, per troy oz.	$700
Silver ingots, per troy oz.	$7.50
Vanadium	$6.00
Zirconium sponge	$12.00-$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Sept. 24—562.88
Sept. 25—560.50
Sept. 26—Holiday
Sept. 27—560.23
Sept. 28—557.85

Scrap Prices
Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	58½	54½
Yellow brass	55⅛	51¾
Red brass	55⅜	52¼
Comm. bronze	55¾	52½
Mang. bronze	57⅜	47½
Free cutting rod ends	54	53

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	52
No. 2 copper wire	43
Light copper	34

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	48
No. 2 copper wire	39
Light copper	30
No. 1 composition	50
No. 1 comp. turnings	47
Hvy. yellow brass solids	35
Hvy. yellow brass turnings	33
Radiators	40

Aluminum

New mixed clips	32	—33
Old sheet	30	—31
Old cast	30	—31
Clean dry borings	31	—32

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	31	—32
Mixed L.C. clips	27	—29
Old sheets and cast	23	—24
Borings and turnings	20	—21
Duraluminum clippings	24	—25

Copper and Brass

No. 1 copper wire	45	—46
No. 2 copper wire	37	—38
Light copper	33	—34
Radiators	32	—33
No. 1 composition	41	—42
No. 1 composition turn'gs	38	—39
Cocks and faucets	30	—31
Clean heavy yellow brass	28	—29
Brass Pipe	29	—30
New soft brass clippings	42	—43

Lead

Heavy soft lead	9	—10
Whole batteries	3	— 4
Type metal	14	—15
Electrotype	13	—14

Nickel

Nickel solids	120	—130
Nickel rod ends	120	—130
Nickel sheets, clips	120	—130
Nickel turnings	45	— 55

Zinc

New zinc clippings	18	— 19
Old diecast zinc	14	— 15

EFFECTIVE OCT. 1, 1984

(Effective October 1, 1984) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 88.00 to	$ 89.00
No. 2 hvy. melting	78.00 to	79.00
No. 1 dealer bundles	104.00 to	105.00
No. 1 factory bundles (auto)	99.00 to	100.00
No. 2 bundles	53.00 to	54.00
No. 1 busheling	107.00 to	108.00
Machine shop turn.	12.00 to	13.00
Shoveling turnings	51.00 to	52.00
Cast iron borings	49.00 to	50.00
Low phos. punchings plate	107.00 to	108.00
Heavy turnings	78.00 to	79.00
No. 1 RR hvy. melting	98.00 to	99.00
Rails 2 ft. and under	112.00 to	113.00
Scrap rails, random lgth.	103.00 to	104.00
RR specialties	105.00 to	106.00
No. 1 machinery cast	71.00 to	72.00
Cupola cast	64.00 to	65.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	560.00 to	570.00
18-8 turnings	460.00 to	470.00

Chicago

No. 1 hvy. melting	$ 81.00 to	$ 82.00
No. 2 hvy. melting	74.00 to	75.00
No. 1 dealer bundles	97.00 to	98.00
No. 1 factory bundles (auto)	93.00 to	94.00
No. 2 dealer bundles	51.00 to	52.00
No. 1 busheling	99.00 to	100.00
Shredder scrap	96.00 to	97.00
Machine shop turn.	44.00 to	45.00
Mixed bor. and turn.	46.00 to	47.00
Shoveling turnings	52.00 to	53.00
Cast iron borings	49.00 to	50.00
Low phos. forge crop	117.00 to	118.00
Low phos. punchings plate ¼ in. and heavier	127.00 to	128.00
Low phos. 2 ft. and under	122.00 to	123.00
No. 1 RR hvy. melting	97.00 to	98.00
Scrap rails, random lgth.	99.00 to	100.00
Reroller rails	110.00 to	111.00
Rails, 2 ft. and under	121.00 to	122.00
RR couplers and knuckles	101.00 to	102.00
RR car axles	133.00 to	134.00
No. 1 machinery cast	115.00 to	116.00
Cupola cast	102.00 to	103.00
Stove plate	99.00 to	100.00
Steel car wheels	111.00 to	112.00
Stainless		
18-8 bundles and solids	490.00 to	500.00
18-8 turnings	420.00 to	430.00
430 bundles and solids	120.00 to	125.00
430 turnings	80.00 to	90.00

Philadelphia

No. 1 hvy. melting	$ 80.00 to	$ 83.00
No. 2 hvy. melting	71.00 to	74.00
No. 1 dealer bundles	94.00 to	97.00
No. 2 dealer bundles	48.00 to	51.00
No. 1 busheling	94.00 to	97.00
Shredder scrap	100.00 to	103.00
Machine shop turn.	29.00 to	32.00
Mixed bor. and turn.	29.00 to	32.00
Shoveling turnings	38.00 to	41.00
Low phos. 5 ft. and under	91.00 to	94.00
Low phos. 2 ft. punchings	115.00 to	118.00
Electric furnace bundles	98.00 to	101.00
RR specialties	97.00 to	100.00
Rails, 2 ft. and under	117.00 to	120.00
Cupola cast	77.00 to	80.00
Heavy breakable cast	57.00 to	60.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 57.00 to	$ 58.00
No. 2 hvy. melting	56.00 to	57.00
No. 1 dealer bundles	75.00 to	76.00
No. 2 bundles	39.00 to	40.00
No. 1 busheling	74.00 to	75.00
Drop forge flashings	45.00 to	46.00
Machine shop turn.	53.00 to	54.00
Mixed borings and turn.	26.00 to	27.00
Shoveling turnings	54.00 to	55.00
Cast iron borings	37.00 to	38.00
Heavy breakable cast	40.00 to	41.00
Mixed cupola cast	56.00 to	57.00
Automobile cast	80.00 to	81.00
Stainless		
18-8 bundles and solids	455.00 to	465.00
18-8 turnings	360.00 to	370.00
430 bundles and solids	110.00 to	120.00

Youngstown

No. 1 hvy. melting	$ 66.00 to	$ 69.00
No. 2 hvy. melting	47.00 to	50.00
No. 1 dealer bundles	79.00 to	82.00
No. 2 dealer bundles	35.00 to	38.00
Machine shop turn.	13.00 to	16.00
Shoveling turnings	18.00 to	21.00
Low phos. plate	79.00 to	82.00
Electric furnace bundles	76.00 to	79.00
Galvanized bundles	67.00 to	70.00

Cleveland

No. 1 hvy. melting	$ 60.00 to	$ 63.00
No. 2 hvy. melting	37.00 to	40.00
No. 1 dealer bundles	73.00 to	76.00
No. 1 factory bundles	77.00 to	80.00
No. 2 bundles	19.00 to	22.00
No. 1 busheling	78.00 to	81.00
Machine shop turn.	8.00 to	11.00
Mixed bor. and turn.	8.00 to	11.00
Shoveling turnings	10.00 to	13.00
Cast iron borings	13.00 to	16.00
Cut structural & plates, 2 ft. and under	110.00 to	113.00
Low phos. punchings plate	110.00 to	113.00
Drop forge flashings	42.00 to	45.00
Foundry steel, 2 ft. & under	62.00 to	65.00
No. 1 RR hvy melting	79.00 to	82.00
Rails, 2 ft. and under	115.00 to	118.00
Rails, 18 in. and under	115.00 to	118.00
Steel axle turnings	59.00 to	62.00
Railroad cast	92.00 to	95.00
No. 1 machinery cast	102.00 to	105.00
Cupola cast	58.00 to	61.00
Stove plate	44.00 to	47.00
Stainless		
18-8 bundles	375.00 to	385.00
18-8 turnings	325.00 to	335.00
430 bundles	80.00 to	85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	56.00 to	57.00
No. 1 busheling	80.00 to	81.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 bundles	39.00 to	40.00
Machine shop turn.	14.00 to	15.00
Mixed bor. and turn.	13.00 to	14.00
Shoveling turnings	17.00 to	18.00
Cast iron borings	22.00 to	23.00
Low phos. plate	95.00 to	96.00
Structural and plate, 2 ft. and under	98.00 to	99.00
Rails, 2 ft. and under	98.00 to	99.00
Scrap rails, random lgth.	77.00 to	78.00
No. 1 machinery cast	81.00 to	82.00
No. 1 cupola cast	61.00 to	62.00

St. Louis

No. 1 hvy. melting	$ 70.00 to	$ 71.00
No. 2 hvy. melting	59.00 to	60.00
Foundry steel, 2 ft.	70.00 to	71.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	54.00 to	55.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	23.00 to	24.00
Cast iron borings	27.00 to	28.00
No. 1 RR hvy. melting	70.00 to	71.00
Rails, random length	72.00 to	73.00
Rails, 18 in. and under	93.00 to	94.00
RR specialties	87.00 to	88.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	50.00 to	51.00
Stove plate	83.00 to	84.00
Steel car wheels	101.00 to	102.00
Rerolling rails	80.00 to	81.00
Unstripped motor blocks	61.00 to	62.00

Birmingham

No. 1 heavy melting	$ 73.00 to	$ 74.00
No. 2 heavy melting	67.00 to	68.00
No. 1 dealer bundles	75.00 to	76.00
No. 2 bundles	55.00 to	56.00
No. 1 busheling	75.00 to	76.00
Shredder scrap	97.00 to	98.00
Machine shop. turn.	29.00 to	30.00
Shoveling turnings	43.00 to	44.00
Cast iron borings	43.00 to	44.00
Electric furnace bundles	69.00 to	70.00
Elec. furnace, 3 ft. & under	73.00 to	74.00
Structural and plate, 2 ft.	103.00 to	104.00
Structural and plate, 4 ft.	93.00 to	94.00
No. 1 RR hvy. melting	93.00 to	94.00
Scrap rails, random lgth.	90.00 to	91.00
Rails, 2 ft. and under	108.00 to	110.00
Angles and splice bars	92.00 to	93.00
No. 1 cupola cast	87.00 to	88.00
Unstripped motor blocks	69.00 to	70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 60.00 to	$ 61.00
No. 2 hvy. melting	57.00 to	58.00
No. 1 dealer bundles	73.00 to	74.00
No. 2 bundles	33.00 to	34.00
Machine shop turn.	5.00 to	6.00
Shoveling turnings	7.00 to	8.00
Cast iron borings	20.00 to	21.00
Low phos. 18 in. and under	91.00 to	92.00
Rails, random length	74.00 to	75.00
Rails, 2 ft. and under	88.00 to	89.00
No. 1 cupola cast	62.00 to	63.00
Heavy breakable cast	28.00 to	29.00
Drop broken cast	81.00 to	82.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 52.00
No. 2 hvy. melting	41.00 to	43.00
No. 2 dealer bundles	23.00 to	27.00
Mixed bor. and turn.	11.00 to	13.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	14.00 to	15.00
Clean cast. chem. borings	35.00 to	36.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	50.00 to	51.00
Heavy breakable cast	10.00 to	12.00
Stainless		
18-8 prepared solids	490.00 to	510.00
18-8 turnings	390.00 to	410.00
430 prepared solids	90.00 to	110.00
410 solids	80.00 to	90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to	$ 70.00
No. 2 hvy. melting	58.00 to	60.00
No. 1 dealer bundles	70.00 to	71.00
No. 2 bundles	41.00 to	43.00
No. 1 busheling	78.00 to	80.00
Shredder scrap	76.00 to	78.00
Machine shop turn.	14.00 to	16.00
Shoveling turnings	22.00 to	24.00
No. 1 machinery cast	85.00 to	90.00
Mixed cupola cast	56.00 to	58.00
Heavy breakable cast	14.00 to	15.00

San Francisco

No. 1 hvy. melting	$ 47.00 to	$ 49.00
No. 2 hvy. melting	41.00 to	43.00
No. 1 dealer bundles	37.00 to	39.00
No. 2 dealer bundles	19.00 to	21.00
Machine shop turn.	6.00 to	8.00
Cast iron borings	6.00 to	8.00
No. 1 cupola cast	81.00 to	83.00

Los Angeles

No. 1 hvy. melting	$ 48.00 to	$ 50.00
No. 2 hvy. melting	41.00 to	43.00
No. 1 dealer bundles	38.00 to	40.00
No. 2 dealer bundles	19.00 to	21.00
Machine shop turn.	10.00 to	12.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	6.00 to	8.00
Elec. furnace, 1 ft. and under (foundry)	77.00 to	79.00
No. 1 cupola cast	75.00 to	77.00

Seattle

No. 1 hvy. melting	$ 70.00 to	$ 72.00
No. 2 hvy. melting	59.00 to	61.00
No. 2 bundles	41.00 to	43.00
No. 1 cupola cast	94.00 to	95.00
Mixed yard cast	84.00 to	86.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 91.00
No. 2 heavy melting cut 2 ft. and under	87.00
No. 1 dealer bundles	92.00
No. 2 bundles	53.00
Mixed steel scrap	62.00
Bush. new fact. prep'd.	93.00
Bush. new fact. unprp'd.	83.00
Machine shop turn.	41.00
Short steel turn.	43.00
Mixed bor. and turn.	30.00
Cast scrap	79.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 73.00 to	$ 74.00
No. 2 hvy. melting	60.00 to	61.00
No. 2 bundles	45.00 to	46.00
Machine shop turn.	16.00 to	17.00
Crushed turnings	34.00 to	35.00
Shredder scrap	76.00 to	77.00
Cut structural plate, 2 ft. and under	102.00 to	104.00
Cut structural plate, 5 ft. and under	86.00 to	88.00
Unstripped motor blocks	60.00 to	61.00
Cupola cast	80.00 to	81.00

DURABLE ORDERS POST MODEST RISE

New orders for manufactured goods in August fell after rising the previous month, the drop was the second in three months.

Overall orders dropped 0.7 pct to $192.6 billion, $1.4 billion less than July. August new orders for durable goods alone were up only 0.4 pct, $102.2 billion compared with $101.7 billion in July. The nation's durable goods industries continue to be more up than down, showing pluses in August, July and May, for example.

Capital goods orders in nondefense industries in August dropped for the third consecutive month while the defense industries segment rose again. In the latter category, defense industries orders were up 6 pct in August to $7.7 billion. Non-defense capital goods orders, a key indicator of business investment, declined 4 pct to $26.3 billion versus July's $27.6 billion. They also declined in July compared with June.

In metalworking, machine tools continued to inscribe an erratic path. Total orders dropped almost 56 pct to $201.0 million compared with July's $313.4 million. Within that category there was virtually no change in orders for metalcutting tools, $135.4 million in the eighth month compared with $135.9 million in July. Metalforming machine tools orders dropped precipitously, by 170 pct, only $65.7 million in August versus $177.6 million the previous month.

Primary metals orders rose slightly—$11.3 billion to July's $11.2 billion, the Commerce Department said.

The 0.4 pct increase in durable goods new orders resulted from larger offsetting movements within the major industry categories, the government said. Primary metals in total was up 0.8 pct, and steel increased 4 pct to $4.8 billion. There was no change in orders for transportation equipment, but aircraft and shipbuilding industries declined, 17 pct and 5 pct respectively.

Billions of Dollars, Seasonally Adjusted Monthly Total, unless otherwise noted **Source: U.S. Dept. of Commerce**		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
CAPITAL EXPENDITURES (Annual Rates)				
U.S. Industry, Total	2nd Qtr.	$303.8	$293.2	$261.2
Manufacturing, Total	2nd Qtr.	126.0	122.8	108.8
Manufacturing, Durable Goods	2nd Qtr.	58.3	58.9	48.5
Mining Industry	2nd Qtr.	13.3	14.0	10.9
KEY INDICATORS, Durable Goods Manufacturing				
New Orders	Aug.	102.2	101.7	89.3
Shipments	Aug.	101.1	98.4	87.6
Inventories	Aug.	187.2	185.0	170.5
Unfilled Orders	Aug.	349.2	348.1	309.6
NEW ORDERS, METALWORKING				
Capital Goods Producers, Nondefense Industries	Aug.	26.3	27.6	22.9
Capital Goods Producers, Defense Industries	Aug.	7.7	7.2	4.5
Primary Metals, Total	Aug.	11.3	11.2	10.9
Steel (SIC 331)	Aug.	4.8	4.6	4.6
Iron & Steel Castings (SIC 332)	Aug.	1.4	1.4	1.1
Nonferrous Metals	Aug.	5.1	5.2	5.2
Nonelectrical Mach.-Equip. Industries, Total	Aug.	17.4	18.1	15.3
Engines & Turbines	Aug.	1.3	2.1	0.9
Farm Machinery & Equipment (Shipments)	Aug.	0.7	0.8	0.8
Construction, Mining & Mat. Hdlg. Equip.	Aug.	2.4	2.9	2.2
General Industrial Machinery	Aug.	1.5	1.4	1.2
Fluid Power Equipment** (Index-1972=100)	Aug.	266.0	259.0	210.0
Metalworking Machinery	Aug.	0.9	1.2	0.8
Machine Tools, Total ($ Mill., Unadjusted)***	Aug.	201.0	313.4	137.2
Machine Tools, Metalcutting***	Aug.	135.4	135.9	91.0
Machine Tools, Metalforming***	Aug.	65.7	177.6	46.2
Electrical Mach. & Equip. Industries, Total	Aug.	16.5	16.3	13.5
Elec. Transmission Equip. & Ind. Apparatus	Aug.	2.1	2.0	1.9
Household Appliances	Aug.	1.4	1.5	1.3
Communication Equipment	Aug.	6.1	5.0	3.9
Transportation Equip. Industrial, Total	Aug.	25.3	25.3	21.7
Motor Vehicles & Parts (Shipments)	Aug.	17.4	15.7	14.6
Aircraft, Missiles & Parts	Aug.	7.1	8.3	5.4
Shipbuilding & Military Tanks	Aug.	0.4	0.6	0.2
Fabricated Metal Products, Total	Aug.	12.0	11.0	10.1
Instruments, Total	Aug.	4.9	4.9	4.0

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.